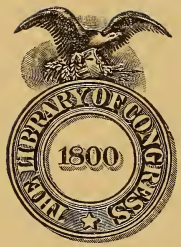
R 737
.U5
Copy 2



Class R727
Book .U5
copy 2

U. S. NAVY DEPARTMENT,

BUREAU OF MEDICINE AND SURGERY.

NAVAL MEDICAL SCHOOLS

1041
296

OF

FRANCE AND ENGLAND,

WITH

OBSERVATIONS ON THE NAVAL HOSPITALS OF TOULON.

REPORTED TO THE BUREAU OF MEDICINE AND SURGERY,

BY

RICHARD C. DEAN,

MEDICAL INSPECTOR UNITED STATES NAVY.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1876.

R737
.U5
copy2

NOV 18 1908
D. of D.

Navy Department,
Bureau of Medicine and Surgery,
November 10, 1876.

The following reports on the "Naval Medical Schools of France and England, with observations on the Naval Hospitals of Toulon," are the result of an inspection of these establishments by Medical Inspector Richard C. Dean, United States Navy, under authority from the honorable Secretary of the Navy and instructions from this Bureau.

J. BEALE,
Surgeon-General, U. S. Navy.

8049 e3

CONTENTS.

Page.

1. Letter of instruction from the Bureau of Medicine and Surgery 3
2. Letter from the honorable Secretary of the Navy 4
3. Letter from Medical Inspector Richard C. Dean, United States Navy, transmitting his report to the Bureau of Medicine and Surgery 4
4. Naval medical schools of France 9
5. Naval medical school, Toulon 27
6. Naval hospitals, Toulon 35
7. Naval hospital of Saint Mandrier 50
8. Education of medical officers for the public service in England 55

(a) Letter of transmission of Medical Inspector Dean, United States Navy; (b) Organization; (c) Faculty; (d) System of instruction; (e) Museum; (f) Libraries; (g) Examination of Candidates.

ILLUSTRATIONS.

Plate I. Original Medical School of France, (Rochefort.)
II. Proposed Naval Hospital, Toulon.
III. Naval Hospital, Toulon, (basement.)
IV. Naval Hospital, Toulon, (second floor.)
V. Naval Hospital, Brest.
VI. Royal Victoria Hospital, Netley.
VII. Royal Victoria Hospital, (basement.)
VIII. Royal Victoria Hospital, (first floor.)
IX. Royal Victoria Hospital, (second floor.)

NAVAL MEDICAL SCHOOLS

OF

FRANCE AND ENGLAND.

I N

NAVY DEPARTMENT,
BUREAU OF MEDICINE AND SURGERY,
June 19, 1874.

SIR: With the view of improving the Medical Department of the Navy, it is deemed desirable to obtain accurate and detailed information relative to the military medical schools and hospitals of the most advanced nations of Europe. Your approaching cruise in European waters will afford you many facilities for visiting those institutions, and observing their organization, methods of management, and general working.

Relying on your scientific and general intelligence, the bureau has to direct that you will avail yourself of every opportunity to make a careful inspection of these establishments, both in England and on the Continent, and to collect all the information your time will allow on every point of interest connected with them. When performing this duty, you will be pleased, in the case of the schools, to investigate the methods of instruction pursued, and, in that of hospitals, to consider the important subjects of ventilation, heating, and drainage as special objects of study. Copies of curricula of studies at the former, and of regulations for the administration of the service of the latter, would greatly contribute to the attainment of the purposes contemplated by the bureau in giving you these instructions. You will be pleased, at such times as may be most convenient, to communicate the results of your observations and inquiries to this bureau.

Very respectfully,

J. BEALE,
Surgeon-General, United States Navy.

Medical Inspector RICHARD C. DEAN, U. S. N.,
Washington, D. C.

NAVY DEPARTMENT,
Washington, June 20, 1874.

SIR: I herewith inclose a communication addressed to you, under date of the 19th instant, by the chief of the Bureau of Medicine and Surgery, inviting your attention to several points respecting military medical schools and hospitals, and asking you to report the result of such observations as you may make on the subject, in pursuance of special orders received, to him. You will please make all your reports in relation to hospitals, &c., in Europe, to the Bureau of Medicine and Surgery.

I also inclose a general letter, addressed by the Department of State to the ministers and consuls of the United States in Europe, asking them to facilitate you in executing the special duty with which you are intrusted.

Very respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Medical Inspector RICHARD C. DEAN, U. S. N.,
Washington, D. C.

TOULON, FRANCE, *March* 1, 1875.

SIR: I have the honor to state that, for the purpose of carrying out the preceding instructions in regard to visiting the naval and military medical schools and hospitals of Europe, I requested and received, from Rear-Admiral Case, commanding the European squadron, the authority conveyed in the following order:

"UNITED STATES STEAMER FRANKLIN, (1st rate,)
"FLAG-SHIP, EUROPEAN STATION,
"*Naples, Italy, November* 18, 1874.

"SIR: In compliance with your request under date of the 15th instant, for orders to visit the naval and military hospitals of Italy and France, under your general instructions from the Navy Department, to visit

and report on the hospitals of Europe, and in obedience to its instructions to me, to give you orders for that purpose when necessary, you will proceed to visit the hospitals indicated, and you will arrange with Captain English to rejoin the Congress when that duty is completed.

"Respectfully,

"A. LUDLOW CASE,

"*Commander-in-Chief.*

"Medical Inspector R. C. DEAN, U. S. N.,

"*United States Steamer Congress, European Station.*"

The appearance of a malignant fever on the Congress at this time made it inexpedient for me to leave the ship, and, other causes of prevention occurring, it was not until some months afterward that I felt justified in absenting myself from the vessel. Having been informed by Admiral Jauréguiberry, the préfet maritime commanding the port of Toulon, that it would be impossible for me to pursue my investigations to advantage without being duly empowered so to do by the minister of the marine, I proceeded to Paris, and, through the kindness of Mr. Washburne, obtained the necessary permission to visit all the naval medical establishments of France, embracing those of Cherbourg, Brest, L'Orient, Rochefort, and Toulon.

I selected the latter place to begin my duties, as being the great Mediterranean military port and naval depot of France, and as having had long established within its impregnable fortifications a naval medical school, a naval and a military hospital, and, in its vicinity, the immense receiving naval hospital of Saint Mandrier, for invalids returning from distant squadrons, and from the colonies of Algeria, Senegal, Cochin-China, and New Caledonia.

On my return to Toulon, I learned with regret that the admiral who had received me so courteously before was suffering from a dangerous attack of pneumonia, and was not, for the time being, on duty. This officer is of a very high degree of intelligence, and himself feels a deep interest in hospitals and all means for the amelioration of the

condition of the sick in the naval service. I had found him on the occasion of my former visit very well informed on the subject and acquainted with the principles of modern hospital construction adopted in America, which he strongly favored, and had advocated in connection with the project of erecting a new naval hospital at Toulon. I was sorry to lose the benefit of his experience and influence, but was informed by Contre-Amiral Lagé, the acting préfet, that dispatches had been received from the minister in regard to my visit, and that every facility would be afforded me to examine all the medical establishments of the port.

I was cordially received by Dr. Arlaud, the director of the school, and by the staff of professors and medical officers attached to the institution, whom I found also apprised of the object of my visit through dispatches from Paris.

These gentlemen all tendered me their services of assistance, and invited me to be present at their lectures, and to visit the hospital at all times I should desire. I have accordingly entered upon a daily attendance at the hospital at the hours of the lectures and demonstrations, and of the visits to the patients in the wards; believing this to be the best plan of acquainting myself with the method of instruction and management.

I have also been allowed the privilege of using the extensive library of the school, and of examining the archives of the institution, which I have found to be valuable and interesting sources of information.

I have the honor to transmit herewith the accompanying reports, which are designed only as preliminary to a final and general report of the result of my observations.

Very respectfully,

RICHARD C. DEAN,

Medical Inspector, United States Navy.

Surgeon-General JOSEPH BEALE, U. S. N.,

Chief of the Bureau of Medicine and Surgery,

Navy Department.

NAVAL MEDICAL SCHOOLS

OF

FRANCE.

NAVAL MEDICAL SCHOOLS OF FRANCE.

For more than a century the government of France has deemed it the interest of the state to superintend the education of medical officers for the naval service. During the whole of that period schools have been maintained in which the special training required for this purpose could be given to young men who were candidates for appointment or promotion in the medical corps of the navy. This system, now held in such high repute, seems to have been adopted slowly, gradually, and even reluctantly at first, and to have been rather an outgrowth from the requirements of the service than a preconceived plan. From its intimate connection with the main subject of this report, and in view of a similar need presenting itself more and more every year in our own country, it may be desirable to give a brief sketch of the origin and establishment of the present method of preparing medical officers for the navy in France. And, for the encouragement of any who may some day undertake to secure for our service so great an advantage, let it be observed that here it was only achieved after many disappointments, repeated refusals, and much indifference from those high in authority. Fortunately the project found an advocate whose zeal and courage accepted no defeats, and who, undismayed by the failure of his first efforts, pressed patiently on until he won complete success.

Monsieur Dupuy, having been appointed in 1715 principal surgeon at the port of Rochefort, found manifold complaints made of the ignorance and inefficiency of the surgeons embarked on the ships. These he soon ascertained to be well founded, and forthwith addressed a letter to the minister, in which he suggested the inaugura-

tion, at the hospital of Rochefort, of a system of instruction for young men to qualify them for the duties of naval surgeons. No action was taken on this recommendation, either at this time or upon a repetition of it, later in the same year. In 1716, M. Dupuy submitted anew farther representations on the subject, stating the impossibility of procuring otherwise surgeons who should be capable and properly instructed. This request met with no better success than the others. In 1717, a fourth time, the attention of the minister was called to the matter, but without avail. In 1719, however, permission was given to make demonstrations of anatomy in the hospital, and of chemistry in the laboratory; but no assistance was given, either in teachers or money.

In spite of all the difficulties he encountered, M. Dupuy continued to urge the opening of a school of medicine and surgery, and, in 1720, he went in person to Paris, and pleaded his cause before the naval council and the high admiral of France. He represented that, by connecting a school of medicine with the hospital itself, students could become acquainted in advance with the various diseases and injuries received by mariners, in all parts of the globe, in war and peace, and that this was a precious source of instruction which it would be criminal not to utilize. He also argued that, by placing the school in the midst of a maritime population, young men would be attracted to it who were already familiar with the manners and customs of sailors, and who would not feel the same repugnance to scenes in a life so rude and perilous as those who were suddenly introduced to it as strangers. His able advocacy finally prevailed, and he obtained the authority he had so long sought.

On his return, however, he could only procure from the commandant at Rochefort, for his use, one room, which was very dark and inconvenient, and which was partly filled with invalids. A plan submitted to the minister for the erection of a suitable building was not adopted for some time, but was at length approved in 1721, and one year later the structure was finished. (See Plate 1.)

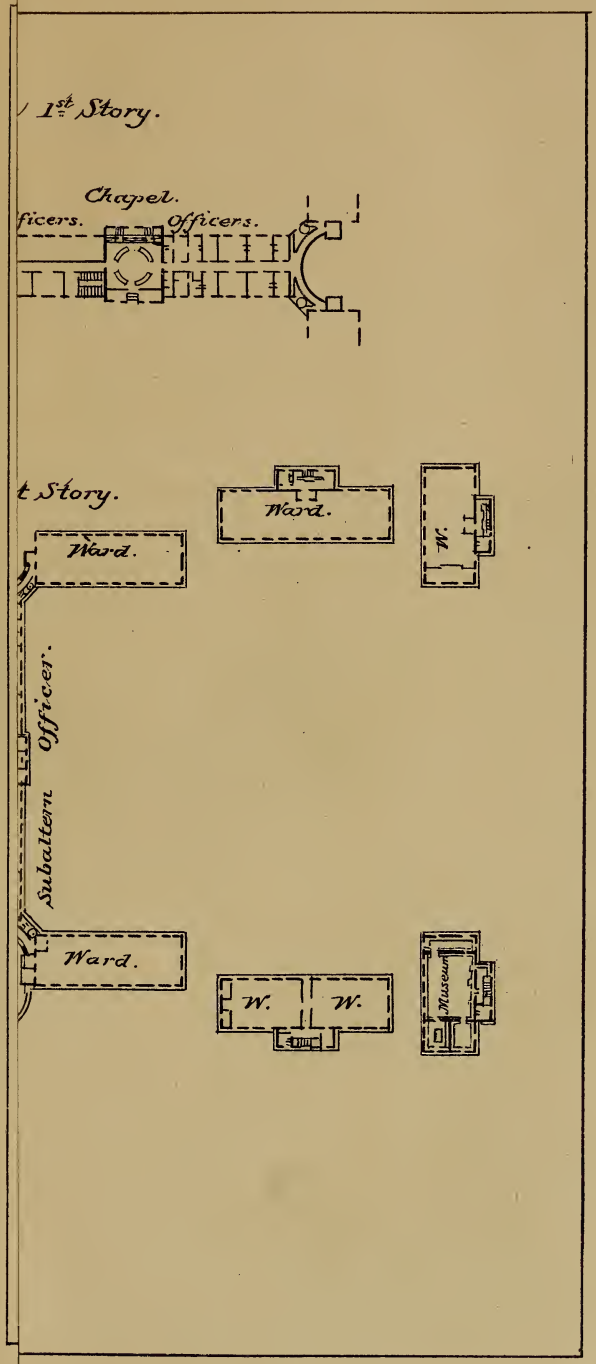

1st Story.
Chapel.
ficers.
Officers.
t Story.
Ward.
Ward.
W.
Subaltern Officer.
Ward.
W.
W.
Museum

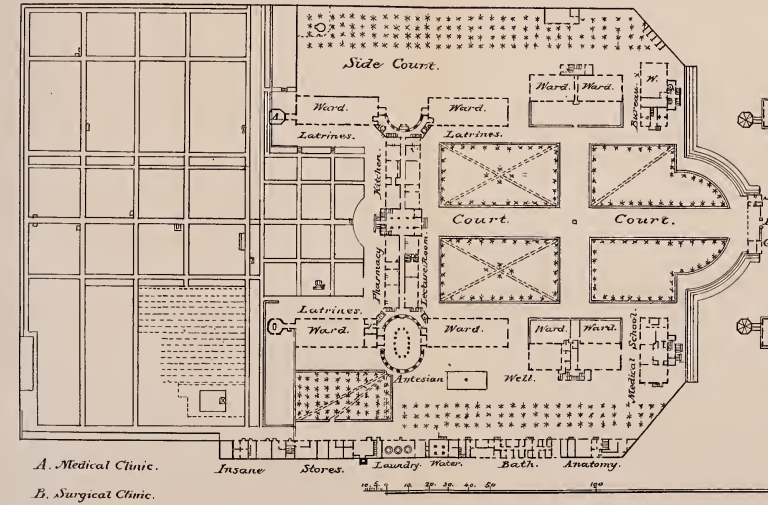
PLATE I.

Original Medical School of France.

Naval Hospital at Rochefort.

Centre 1st Story.

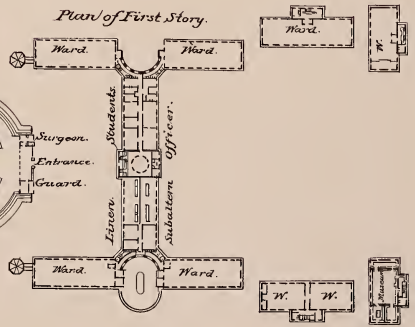
Plan of Basement.



A. Medical Clinic.

B. Surgical Clinic.

Plan of First Story.



Everything being at last in readiness, in 1722 the first naval medical school of France was formally opened, in the presence of the naval and the civil prefect, and a large number of naval officers of all grades. So immediate and complete was its success that the minister wrote to Mr. Dupuy to express to him how much the King was gratified with his zeal for the good of the service, and with the wisdom of his views for perfecting the institution he had created. He also gave him liberty to do anything he should believe advantageous for the improvement of an establishment which His Majesty intended to favor with his particular assistance. Subsequently, Mr. Dupuy was recompensed for his long and valuable service by having conferred on him a title of nobility. Thus it appears that it was chiefly to the untiring efforts of one individual that France is indebted for an institution which has, without doubt, kept her marine supplied with medical officers of the highest order of intelligence and efficiency.

So acceptable were the results of the new system to the government that it was within a few years extended by the foundation of additional schools at Toulon and Brest. The former was established in 1725 and the latter in 1731; and since that time, during a period of more than a hundred years, these three schools have continued to enjoy the confidence and support of the nation under every form of government.

A multitude of regulations and orders of the olden time have been preserved among the archives of the school at Toulon, some of which are extremely curious, in regard to the management of the schools; but I have not been able to find any law establishing them previous to a royal *ordonnance*, issued in 1768, which is as follows. The diction is rather antiquated, and, according to present notions, scarcely grammatical, but the intent is clear:

"De par le Roi."

"Il sera choisi, dans l'intérieure, ou à portée de l'hôpital de chacun des ports de Brest, Toulon et Rochefort, les lieux com-

modes et convenables pour y établir les écoles de médecine et de chirurgie navale, lesquels ne pourront être, sous quelque prétexte que ce soit, pris pour d'autres usages.

" Du Premier Mars 1768.

Signé, " LOUIS."

During all the confusion and overthrow of established institutions in the Reign of Terror, and during the days of the republic, these schools remained undisturbed, and were continued by a special decree of " 17 Nivôse, An IX."

It is an interesting fact, which may be mentioned here, that the medical corps of the navy of France owe to the spirit of equality which prevailed at this epoch the concession of a right which they had long sued for in vain, that of being assimilated in all respects with the surgeons of the army. Perhaps never in any other place than before this decree appeared with more appropriateness the notorious motto of the republic.

" LIBERTÉ, ÉGALITÉ, FRATERNITÉ."

" 12 Messidor, l'an troisième de la République Française, une et indivisible. (30 June, 1795.)

" Les officiers de santé de la marine seront assimilés aux officiers de santé des armées de terre pour le classement et le traitement. Il en sera de même pour les accessoires, les indemnités, les congés, les retraites, et autres attributions.

Signé, " CAMBACÉRES,

"*Président.*

" ROUX, VERRON, RABAUT, MARNE, *Comité.*"

How simply and easily such a law would have settled all the contentions which not long since disturbed the medical corps of our Navy!

No doubt, many a perplexed candidate before the naval medical board of a certain other republic would be grateful for such a privilege as was accorded by this all-equalizing time in the following decree in regard to the examinations for assistant surgeons:

"LIBERTÉ, ÉGALITÉ, FRATERNITÉ."

"19 Pluviose, An VI de la République Française, une et indivisible.

"Le concours pour toutes les classes aura lieu en public et de vive voix: les questions seront faites par écrit, et tirées au sort. La question tirée, les juges ne pourront point interrompre le candidat, ni lui proposer aucune espèce de questions incidentes."

Another curiosity of this time is the following table for summing the qualifications of candidates, given as a model in the same decree:

Nom du individu.	Anatomie.	Chirurgie opératoire.	Pathologie médicale.	Pathologie chirurgicale.	Hygiène navale.
Pierre	Très bien	Bien	Bien	Faible	Bon.
Paul	Passable	Bien	Mal	Très mal	Bien.

Nom du individu.	Histoire naturelle.	Accouchements.	Chimie.	Total.	Décision.
Pierre	Passable	Bien	Mal	Bien	Accepté.
Paul	Faible	Faible	Passable	Mediocre	Rejeté.

These medical schools for the navy were equally cherished by both the first and second empires, and the records of these periods contain many expressions of the highest commendation toward institutions which were considered to render valuable service to the state.

The commission of the budget in 1836–'37 reported to the Chamber of Deputies that "the organization of the medical schools of the navy, which exist in our ports, invariably tends to produce that high capacity and tried courage, the influence of which, however indirect, is so powerful upon the success of our naval operations. Above all, it is important to have medical officers who deserve confidence, and who know how to command it—men of science and of action, skillful

and firm in the day of battle as well as among the victims of deadly epidemics, able to forward the advance of science by study and observation in the distant countries where they are called to serve, and to add still more to the influence of the name of France, through the reputation for humanity and disinterestedness which their predecessors have so justly acquired."—(Moniteur, 15 Mai 1836.)

In 1841, the minister of the marine expressed himself thus on the same subject: "The medical corps has ever sought to distinguish itself solely by superior talent and eminent service. It numbers many men, profoundly instructed, honoring science by the manner in which they cultivate it, and full of zeal for the accomplishment of their duties toward humanity. The schools of medicine at Brest, Rochefort, and Toulon enjoy also a high reputation, justly merited. There, learned professors, who are no other than officers of the corps, give to numerous pupils instruction which is not disclaimed by the most renowned of the faculties of Paris."

During a discussion in the Chamber of Peers in 1847, several illustrious members spoke in terms of eulogy of these schools, and the president, M. Mesnard, made the following remarks: "Such is the organization of the corps which performs its duties at Toulon, Brest, and Rochefort. The instruction is given by professors, who, bearing the title of 'docteur,' are not those who honor it least. The pupils leave the chair of the professor to go, under his conduct, to the bedside of the sick, passing thus from the lesson to its application on a vast scale."

The same orator, in advocating the allowance for the expenses incurred by assistant surgeons in obtaining the degree of doctor of medicine, exclaimed, "What, the cost of the diplomas! It has been paid ten times over. It has been paid with a price no other persons will ever pay. It has been paid by services rendered to the country in the midst of hardships, in perils of the sea, and of far-distant voyagings. They have been paid by sacrifices the state ought never to forget."

Many of the most distinguished names in the annals of French medicine are to be found on the rolls of these schools, and men, who afterward threw a lustre on the profession of France and of the world, received here their earliest education and experience.

Larrey, previous to his brilliant career in the army, was examined for admission into the navy at Brest, and served on board the Vigilante and other ships for nearly ten years, from 1777 to 1788.

Broussais was also examined at Brest in 1794, and served on board the Renommée, L'Hirondelle, and Bayonne.

Recamier was examined at Toulon in 1795, and served on board the Ça Ira during the sanguinary engagement with the English fleet, in which 400 men were killed and wounded on that transport, including the senior surgeon.

Numerous re-organizations of the schools have been made from time to time, involving various changes in the mode of management. The last regulations on the subject were issued by the minister of the marine in 1866, and are the ones in accordance with which the teaching is now conducted. But more recently, in 1873, a commission has been in session in Paris for the purpose of making further modifications and improvements. These have not yet been adopted by the government, but have been kindly placed at my disposal by Dr. Arlaud, who was a member of the commission, and are embodied in the following account of the method of admission, instruction, and examination in the medical corps of the navy.

The naval medical schools established by the department of the marine in the ports of France are designed for the education of medical officers and pharmaceutists for service in the navy and in the colonies. The instruction is given by medical directors, by physicians and pharmaceutists-in-chief, by surgeon and pharmaceutist professors, and other officers of the medical corps belonging to the higher grades. Of these, the senior officers are permanently attached to the schools, but are assisted by members of the junior grades known as "agrégés," or "fellows," whose duties are tempo-

rary, and continue for three years only at a time. While the latter are engaged in this special duty, they are exempted from orders to sea.

In each school there are—

An amphitheater for dissections;

An amphitheater for lectures on medicine and surgery;

An amphitheater for lectures on chemistry;

A library;

A botanical garden;

A museum of natural history, pathology, and anatomy.

These rooms, with their appendages, constitute the medical school proper; but the wards of the naval hospitals are also used by the professors for clinical instruction.

No students are received into these schools unless they are "bachelors of letters" and "bachelors of sciences," and are at least eighteen years of age. They must also be citizens of France. A physical examination precedes the admission, which ascertains that the candidate has integrity of the special senses, and of all the organic functions; that he is vaccinated, and has no specific disease. Students are subjected to a certain discipline, and to a scale of punishments ending in dismission. Expelled from one school, they are excluded from all the others, and the naval career is closed against them. Attendance on the lectures and clinics is obligatory, and unjustifiable absence from them is followed by dismissal.

All the members of each school are classified in two divisions. Those of the first year form the second division, and all the others form the first division. Promotion from the first to the second division is only obtainable by passing an examination at the end of the year. Those who fail to pass the examination are retained in the second division, and, in case of a second failure, are dismissed.

The curriculum of studies is as follows:

1. Legal and administrative medicine.
2. Clinical medicine; medical pathology.
3. Materia medica and therapeutics; toxicology.

4. General and naval hygiene.
5. Clinical surgery; surgical pathology.
6. Operative surgery.
7. Anatomy and physiology.
8. Obstetrics, diseases of women and children.
9. Chemistry.
10. Pharmacy and medical physics.
11. Natural history, (medical;) pharmacology.
12. Descriptive anatomy.
13. General pathology and semeiology.
14. Minor surgery; apparatus and bandaging.
15. Extemporaneous pharmacy; chemical manipulations.

The annual course is divided into two sessions, one in winter and one in summer. Part of the above branches are taught in one session, and the remainder during the other. Every subject is lectured on three times a week, and every professor completes his course once in two years.

Every professor prepares, for the director of the school, notes in regard to the students and assistant surgeons who attend his lectures, to be referred to at the examinations. Assistant surgeons remain under instruction for two years after appointment, and are only sent to sea during six months of that time. After two years passed in that grade, they are granted a leave of absence, on full pay, for the purpose of presenting themselves for the degree of "doctor of medicine" before one of the "faculties" of France empowered to grant diplomas. This six months' leave can neither be extended nor renewed, and during its continuance a certificate must be sent every month to the director of the school to which they belong, showing that they are engaged in pursuing the object for which the leave was granted. This certificate is given by the secretary, and viséed by the dean of the faculty.

For all the expenses incurred in procuring this degree, they are re-imbursed from the funds of the department of the navy, upon the

production of the diploma. In return for the above privileges, of receiving a medical education without cost, and of having the expenses of procuring a degree in medicine defrayed by the government, they are required to engage themselves to remain in the service ten years, or to restore to the department the amount of the latter expenditure. The written contract to this effect is sent to the legal agent of the treasury, who, if necessary, compels them, by process of law, to refund the sum.

EXAMINATIONS FOR ADMISSION AND PROMOTION IN THE MEDICAL CORPS.

The examinations for appointment as assistant surgeon in the navy, or for promotion to a higher grade, are conducted with great formality, and in a manner essentially different from that in use in the United States. Though a very complex method, it is a very interesting one, and, as it seems to me, could scarcely have been devised out of France, characterized, as it is, by the remarkable ingenuity and suspiciousness which are eminent traits of the French people.

It could not be more impartial, even if the object of the ordeal were to determine the life or death of the candidate. Unfairness is impossible, both examiners and candidate being strangely disconnected from a proceeding, apparently directed by an unseen hand, which only invokes their assistance as instruments.

The medical examining board, or "jury of competition," as it is most appropriately called in France, is composed of four members, and an alternate or substitute, the junior member acting as secretary. The four members are—

1. A medical director, who presides;

2. A "physician-in-chief," who is a professor in the school where the examination is held;

3. Two professors, of whom one belongs to each of the other two schools.

The alternate is a professor in the school where the examination is held.

The selection of professors who are to assemble as a medical jury in any school is made in the following manner: On the first of September of each year, at a meeting of all the professors of each school, lots are drawn to determine the names of the two professors who are to go to the two other schools; the name of the one who is to be a member of the jury in his own school; and, finally, the name of the alternate. The director of each school sends the names so designated to the préfet maritime, who transmits them to the minister of marine. The minister orders the members to the different schools in such a way as to secure as fair and impartial a jury as possible. As an evidence of the extreme precaution taken in this regard, it is worthy of note that if a member of a jury is any relative or connection of a candidate, even to the fourth remove, he cannot take part in the examination of that candidate, but must yield his place to the alternate.

The examination for the appointment of assistant surgeons is on the following subjects:

1. Anatomy	Oral.
Performance of a dissection	
2. Pharmacology	Oral.
Extemporaneous pharmacy	
3. Minor surgery	Oral.
Application of apparatus and bandages	
4. General pathology and semeiology	Written.

The examination for promotion to the grade of surgeon of the second class comprises—

1. Anatomy and physiology	Oral.
2. Materia medica and therapeutics	Oral.

3. External pathology	Oral.
Operative surgery	
Obstetrics	
4. Internal pathology	Written.
Hygiene	
Legal medicine	

For promotion to the grade of surgeon of the first class, the examination is on the following subjects:

1. Physiology	Oral.
2. Clininal medicine	Oral.
3. Operative surgery	Oral.
Obstetrics	
Performance of one surgical and one obstetrical operation	
4. Naval hygiene	Written.
Pathology	
A report on medical jurisprudence	

This report must be written and placed in a sealed envelope in two hours after the commencement of the session.

QUESTIONS.

Lists of questions are prepared, in secret conference, by the juries at each school, and are sent to Paris to the minister of the marine. All the questions from all the schools are placed together, and a commission composed of the supérior medical council and the director of the "Archives of Naval Medicine" makes a selection from the number. The questions chosen are placed in closed envelopes, sealed, signed *on their folds* by the members of the commission, and addressed by the minister of the marine to the préfet maritime of the port where the examination is to take place. The préfet transmits them to the president of the jury *after* it has assembled. When the examinations are concluded, the questions which have not been used are returned

to the minister of the marine without the seals of the envelopes containing them being broken.

On my expressing surprise at the suspicion of the good faith of every one concerned in the preparation and custody of these questions, I was informed, in a reply more idiomatic than satisfactory, that "the thought did not come to any person to believe that the secret would not be guarded as to the tenor of the questions chosen, but a secret could be surprised; and, in a word, a secret being able to be violated, this possibility made it necessary to adopt a method of keeping it that should be inattackable."

MANNER OF CONDUCTING THE EXAMINATIONS.

Before the opening of the examination, the jury, in secret session, arranges the list of competitors, which is posted in a conspicuous place. The examinations are held in public. The commander-in-chief of the station presides at the opening of the first session, and the secretary reads the order convening the jury, and calls the roll of the candidates. The names of those present are placed in an urn. If the number is large, the lot determines which ones shall be examined in the first series, and the names of these are again placed in the urn.

The president publicly breaks the envelope containing all the questions. Those for the different grades are found within, placed in special envelopes. The envelope containing the questions intended for the first examination is next broken. Every question, sealed, bears a number. The president places in another urn as many balls as there are questions sent by the minister, each ball bearing a number corresponding to that on a question. A person designated by the president draws from the urn the name of the first candidate to be heard. All the other candidates are immediately conducted to an isolated apartment, and locked in by a member of the jury, whence they are successively called as the lot determines the turn of each. One of the balls, containing a number corresponding to that on one

of the questions, is then drawn from the urn. The president breaks the seal of the envelope bearing the same number, and reads aloud the question which it contains, which is then handed to the candidate. This same question must now be submitted to all the candidates, each in his turn; no communication being allowed between them. By the same method, a new question is drawn at every following session. Every remark, every sign of approbation or disapprobation, is prohibited to the members of the jury during the examination, which must be conducted in silence by the jury, excepting that the president may recall the candidate to the question if he should wander from it in his reply.

The time allowed each candidate to answer each question is:

For the grade of assistant surgeon, one-half hour, after ten minutes of reflection;

For the grade of surgeon of the second class, one-half hour, after ten minutes of reflection;

For the grade of surgeon of the first class, three-quarters of an hour, after fifteen minutes of reflection;

For appointment as "fellow," (*agrégé*,) one hour, after half an hour of reflection;

For appointment as professor, one hour, after half an hour of reflection.

The candidates, if they wish, can retire into a room adjacent to the examination-room while they consider their answers; but they must be isolated and kept under surveillance. It is forbidden them, under penalty of exclusion from the examination, to make use of any books or papers of reference; but they have the privilege of making memoranda to guide them in their replies.

During the whole of the session, the candidates remain without any communication, and under the observation of a professor, who countersigns all the written answers, and places them in sealed envelopes, to be read aloud by the candidate on the following day in public.

They are then again placed in sealed envelopes, and reviewed by the jury in private session.

Candidates who have been partially examined are recalled at an interval of forty-eight hours to answer another question. Every candidate who fails to answer a question is excluded from further examination. When any answer seems insufficient, the president calls the attention of the jury to it, and it is decided by vote whether it shall be received. If it is declared inadmissible, this decision is announced, and is entered by the secretary on the records.

Immediately after having heard the last candidate in each series, the president gives to each member of the board a list of the candidates examined, arranged in alphabetical order. Each member writes after the name of every candidate a number indicating his estimates of the answers given. Zero signifies total failure; 5, bad; 10, tolerable; 15, good; and 20, very good. Each paper is then folded and sealed by the member voting, and marked with the grade of the candidate. The papers for each grade are then counted by the president and placed in a common envelope, which is indorsed with the signatures, of all the members voting, and deposited in a secure receptacle.

After the examinations for all the grades have been concluded, the papers are opened in the presence of the préfet maritime, (commander-in-chief,) commencing with those of the highest grade. All the professors who have voted are present at the opening. The préfet designates two among them to scrutinize the votes. Each one of the two prepares a list in alphabetical order of all the competitors. The president breaks the envelopes of the different bulletins relating to each grade, and reads them aloud, indicating the numbers attached to each name. After the enrollment of the votes on the lists of the two scrutinizers, these lists are compared and verified. These general lists are then signed by all the members of the jury and countersigned by the préfet maritime. One of them is transmitted to the minister of the marine, together with the bulletins of the votes, and

the other is attached to the record of the examination and deposited in the archives of the medical council.

A "superior commission," appointed by the minister of the marine, is charged with the final classification of the candidates borne on the general lists forwarded from all the schools. This commission is composed of—

1. A vice-admiral, member of the board of admiralty;
2. The members of the superior medical council;
3. The chief of the bureau of medical administration.

The candidates are arranged by the commission according to the aggregates of the numbers they have received. No candidate is considered admissible unless he has obtained at least an aggregate of 200. In case of equality, age determines precedence. After the opening of the bulletins containing the votes, the commission sends the report of its proceedings to the minister of the marine, together with the various papers which have been used in arriving at the final classification of the candidates. The list of successful candidates in the order of precedence is then published in the "Bulletin Officiel de la Marine," the last step of this extraordinary examination, in which it is difficult to say which of the parties concerned seems to be the greatest object of suspicion, none being trusted to perform their duties from motives of conscience and honor. The government apparently takes the ground that "they may all be honest, but that they will all bear watching."

It is certain, however, that no rejected candidate can complain of unfair dealing, as all are subjected to exactly the same ordeal by inexorable machinery.

As with us, the competition for the appointment of assistant surgeon in the navy is open to any of the young men educated in other medical schools of the country, under certain conditions. The "facultés" of France confer separate diplomas for each branch of medicine, so that a student may have obtained a diploma for anatomy or chemistry, but may not yet have been granted one for sur-

gery or pathology, &c. To be admitted to the competitive examinations for appointment as assistant surgeons, it is required that the candidate, if not educated at a naval medical school, should have studied medicine two years and have eight diplomas. He must also be under twenty-three years of age. After three years of service, and six months at sea, assistant surgeons, having in the mean time taken their "doctorat," are eligible for promotion to the grade of "médecin" of the first class.

The examinations to fill the vacancies in the medical corps of the navy are held every year, commencing on the 15th of September. They are announced two months in advance in the Moniteur.

NAVAL MEDICAL SCHOOL, TOULON.

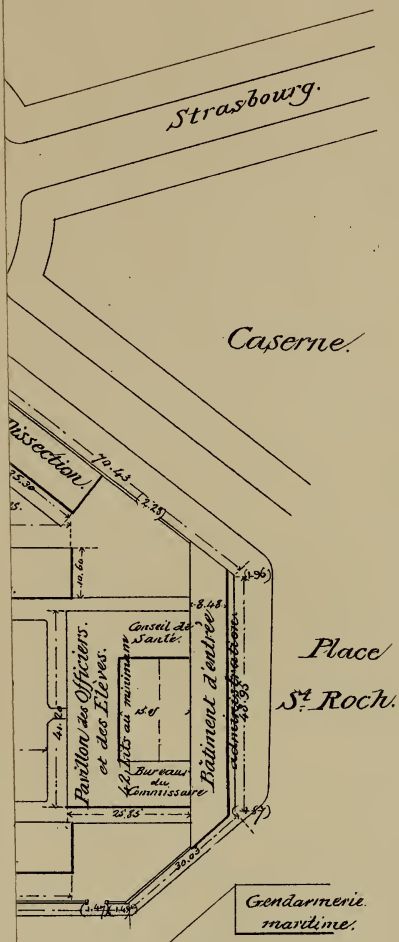
At Toulon, the old buildings continue to be used as a hospital and medical school. Founded many years ago for a different purpose, they are far from being well adapted to the one to which they have since been devoted, but have been modified to meet existing requirements as well as circumstances would allow. A new edifice has been projected to replace the present one; but its construction has been delayed by the recent war, and the resulting change of government. It is designed on a magnificent scale; the estimated cost of its completion being not less than five million francs. A copy of the plan is transmitted with this report. (Plate 2.)

The rooms employed for instruction are for the most part in the basement of the hospital, and in other portions of the building, unsuitable for the accommodation of the sick. There are three amphitheaters, in which are delivered the lectures on anatomy, medicine and surgery, and chemistry. They are rather inconveniently small; but their limited size admits of the lectures being given in a comfortable and informal manner; the lecturer sitting, and addressing his discourse to the students in a semi-conversational tone, occasionally rising to illustrate his remarks with models or on the black-board.

In the anatomical-lecture room physiology and anatomy are taught together by the same professor, who gives the function and uses of every tissue or organ in connection with its description.

Adjoining the chemical-lecture room are the laboratory and department of pharmacy, both very completely equipped for the purpose of teaching, in a practical manner, chemistry and pharmacy, which are regarded as important branches of naval medicine.

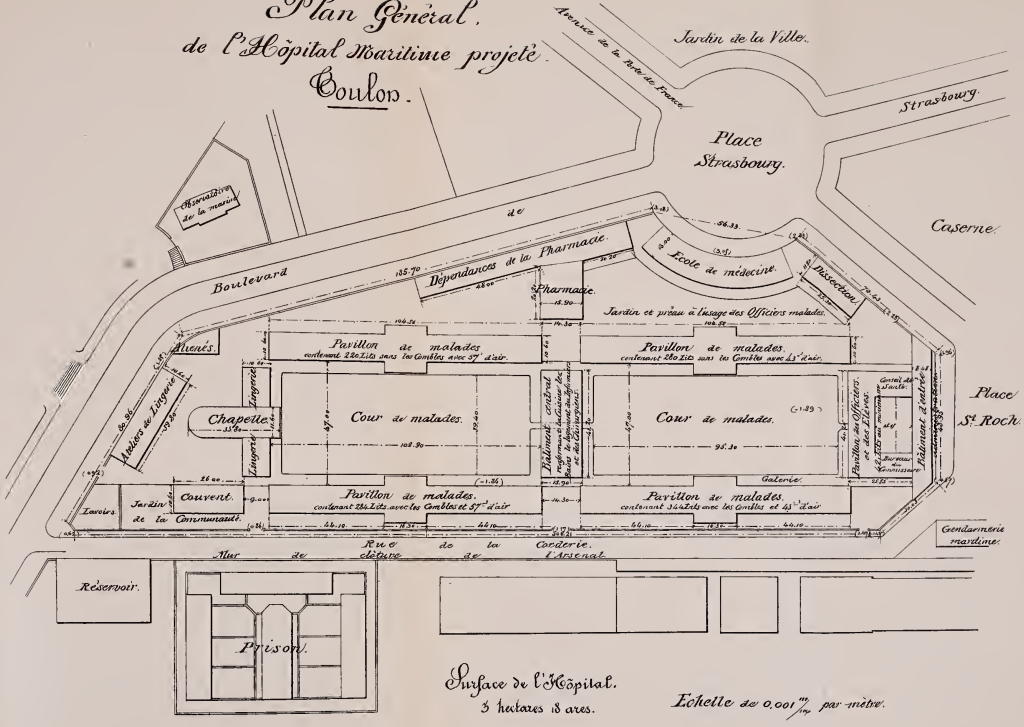
To avoid prolixity, I have omitted any account of the education of apothecaries, but will mention here that it is a feature of these schools


Strasbourg.
Caserne.
Place
St. Roch.
Gendarmerie
maritime.
Pavillon des Officiers
et des Élèves.
Conseil de Santé.
Bureaux du Commissaire
Bâtiment d'entrée
Amphithéâtre
Salles de dissection
Salles de dissection
10.63
2.25
1.96
8.48
4.25
23.33
48.33
30.00
1.42
1.45

par mètre.

PLATE.II.

Plan Général de l'Hôpital Maritime projeté à Toulon.



Surface de l'Hôpital.
3 hectares 18 ares.

Echelle de 0,001 m/m par mètre.

that in them the apothecaries for the navy are educated by the state, as well as the surgeons. These "pharmaciens," as they are called, form a regular corps in the French navy, of very respectable standing, and are required to pass competitive examinations for appointment and promotion. Those holding the position of "pharmacien-en-chef" have the assimilated rank of "capitaine de vaisseau," (colonel.) No student can be admitted to the school of pharmacy unless he has taken his degree as a bachelor of sciences.

There are several commodious dissecting-rooms, in which there is never any lack of "material;" the mortality of the hospital supplying an abundance of subjects. After the death of a patient, the remains are placed in the "chapelle blanche," or mortuary room, for twenty-four hours, and, if unclaimed at the end of that time, are transferred to the dissecting-rooms, on the same principle, I suppose, as the suggestion made by one of the professors here to take, in case of need, a piece of a pulpit for a splint, "La fin justifie les moyens!" On entering these rooms, I have always been struck with the admirable manner in which the subjects were preserved. Not only is there no unpleasant odor, but the color, humidity, and flexibility of the muscles and organs seemed to remain unimpaired for weeks. Remembering the difficulties encountered by the Examining Board in Washington in this respect, I made particular inquiry as to the method of preservation adopted, and have been informed that it is that proposed in 1873 by Dr. Charles Leprieure of the military medical school of Val-de-Gréce. Dr. Merlin, the professor of anatomy, was kind enough to explain to me the nature of the preservative fluid employed, and also to show me the process by which it is used. It is prepared according to the following formula:

Phenic acid,	2	parts in a hundred.
Arsenious acid,	2	
Glycerine,	10	
Acetate of soda,	10	
Water,	76	

The injection is not made with a syringe, but by means of hydrostatic pressure, with a simple apparatus arranged by placing a large glass jar containing the solution in the room above and connecting with it an India-rubber tube of suitable size, which is conducted through the floor to the subject below, and, by a slender nozzle, introduced into the carotid artery and secured. The pressure of the fluid is controlled by a stop-cock so as to maintain it moderately and continuously until every part of the subject is saturated. The quantity required is generally from 5 to 7 liters, (7½ to 10½ pints.) In subjects thus preserved, the muscles remain rosy for two months, the skin retains its natural color, visceral cavities left open are unaffected by putrefaction, and even the brain keeps its consistency for 15 or 20 days. Thinking this matter one of interest and value, I have sent to Paris, and procured the brochure of Dr. Leprieure on the subject, and transmit it with the other documents accompanying this report.

The museum of this school, enriched by contributions from all parts of the globe, made during many years by scientific officers, affords unusual facilities for the study of ethnology, comparative anatomy, natural history, and the pathology of diseases of warm climates.

It contains several interesting specimens said to be unique of their kind in the world. It is very much to be regretted that the space for storing this valuable collection is so inadequate. A ministerial regulation requires medical officers of the navy of France to procure objects of natural history, during their voyages, for the museums of the medical schools, and directs commanding officers to assist them in accomplishing this duty.

The botanical garden belonging to the school, formerly in the city of Toulon, has been removed to Saint Mandrier, and will be described in the report on that institution. Each of the medical schools is obliged by regulation to maintain a garden of this kind. The library contains a large number of volumes, embracing all the classic and standard authors in medicine and the allied sciences, and a variety of medical periodicals. There are also many books of general interest,

such as voyages and expeditions, subjects connected with a naval career. The library-rooms, three in number, are fitted up with long tables, and are used as a study by the pupils of the school, who thus find access to many sources of information which would otherwise be beyond their reach. In these rooms are also kept a number of microscopes, which are always at the disposal of the students, and a complete collection of surgical and obstetrical instruments for purposes of examination and reference. These cannot be removed from the room.

The only expense incurred by students who have been admitted into the school is a trifling sum, paid annually, as a fee for the use of the library, which is employed to assist in replacing any books which may be injured. This fee, I think, is not more than fifteen francs, or about three dollars.

The following is the curriculum of studies, and the list of the faculty, at the school of Toulon:

Subject.	Professor.	Rank.
Medical Jurisprudence	Arlaud	Directeur.
Clinical Medicine; Medical Pathology	Barrallier	Médecin-en-chef.
Materia Medica; Toxicology	Ollivier	Médecin professeur.
General and Naval Hygiene	Cuneo	Médecin professeur.
Clinical Surgery; Surgical Pathology	Barthélemy	Médecin professeur.
Operative Surgery	Beau	Médecin-en-chef.
Anatomy and Physiology	Merlin	Médecin professeur.
Obstretrics and Diseases of Women	Delmas	Médecin 1re classe.
Chemistry and Toxicology	Fontaine	Pharmacien-en-chef.
Pharmacy; Medical Physics	Delavaud	Pharmacien-en-chef.
Medical Natural History	Hereaud	Pharmacien professeur.
Descriptive Anatomy	Michel	Médecin 1re classe.
General Pathology	Quètand	Médecin 1re classe.
Minor Surgery and Bandaging	Geoffroy	Médecin 1re classe.
Extemporaneous Pharmacy	Sambuc	Pharmacien 1re classe.

PERSONNEL.

Dr. Arlaud, the director of the school of medicine and of the naval hospitals of Toulon and Saint Mandrier, is the third officer in seniority on the active-list of the medical corps of the navy. He is 58 years of

age, and has been in the service 38 years. His official title is "directeur du service de santé," (medical director,) and he has the assimilated rank of rear-admiral. In addition to his administrative functions, he also delivers the lectures on legal medicine. He enjoys a high reputation as a surgeon, and has amassed a large fortune by his operations and private practice. In conjunction with his colleague, Dr. Roux, who is now the "medical inspector-general," he performed at the hospital of Saint Mandrier the operation of amputation of the hip-joint four times with four recoveries, a success more remarkable than any that has ever before come to my knowledge, though it is to be noted that none of the cases were "primary" operations, but were all "secondary," or rather were all performed for the relief of chronic affections.) The account of these cases has been published by Dr. Roux in the "Gazette Médicale Hebdomadaire." Having seen Dr. Arlaud operate several times, I can testify to his dexterity, as well as to his extreme ingenuity in the way of contrivances to meet exigencies. One of the latter, a device for the extemporaneous treatment of fractures on the road or in the field, seemed to me so useful that I have obtained a description of it, and transmit it with this report.

Dr. Barrallier, who is the professor of clinical medicine and medical pathology, is the senior "médecin-en-chef" in the navy, and, by the retirement of Dr. Rochard, will shortly be promoted to the position of director of the naval medical school at Brest. He is 61 years of age, and has been in the service 41 years. Notwithstanding that he is somewhat advanced in age, he is an industrious and devoted laborer in his profession, and one of the most instructive lecturers, both clinical and *ex cathedrâ*, that I have ever heard. He is a constant contributor to the medical literature of France.

Dr. Barthélemy, lecturer on surgery, has been in the service 26 years, and has the rank of "médecin professeur." He is also an admirable teacher and a skillful operator. I had the opportunity of seeing an amputation of the thigh performed by him in a case of a most interesting character, as it was a wound of the knee from the ball of a

chassepot rifle. The projectile had entered the joint, and there exploded, producing an injury of as terrible a nature as can well be conceived. "Comminution" will not express the resulting condition of the ends of the bones: they were powdered—reduced to a mass of fine osseous particles, as if they had been ground in a mill, and both femur and tibia fractured, besides, at a distance of some inches from the joint, by the shock of the explosion. I am the more impressed with the destructive power of this weapon from having seen a photograph of a soldier who had been struck by a chassepot bullet, which entered under the chin and passed obliquely upward and backward. The skull was entirely emptied of its contents, and nothing of the face remained but the mouth.

Dr. Beau, teacher of operative surgery, has been in the service 39 years, and is the second in seniority of the "médecins-en-chef." He has published some valuable suggestions in regard to the treatment of fractures, in a small volume, which I herewith transmit, accompanied by photographs of the apparatus he has invented.

Dr. Merlin, lecturer on anatomy and physiology, has been in the service 25 years, and has the rank of "médecin professeur." He has written a very interesting review of the medical and surgical history of the war in America, a copy of which accompanies the other documents herewith sent to the bureau.

Dr. Fontaine, professor of chemistry and physics, is second in seniority of the "pharmaciens-en-chef" of the navy. He is 56 years of age, has been in the service 39 years, and has the assimilated rank of "capitaine de vaisseau," (colonel.) He occupies a very high position, both socially and professionally, and is much respected and esteemed by his colleagues. It is freely admitted that there is no member of the faculty of this school superior to Dr. Fontaine in ability and learning, and in all the qualities that make the gentleman and the scholar. Surely there is no greater contrast than that between the position of a pharmacien in the French navy and that of an apothecary in the navy of the United States, unless it may be between the different manners in which their respective duties are performed.

Any discussion of the vexed question about the position of the apothecaries in our service would be out of place here; but perhaps the question may be pertinent as to whether there is not a lesson for us to be learned from the experience and usage of other nations in this respect.

Without extending in further detail this mention of the medical officers who act as teachers in the school of Toulon, I will add that, from the ample opportunity I have had of forming an opinion, I believe I am justified in saying that, in learning and acquirements, they compare favorably with the faculties of many medical colleges in the United States. That their instruction is thorough is proven by the fact that their pupils pass successful examinations before the faculties of Paris and Montpelier, where the requirements are well known to be rigid and impartial.

The method of teaching is rather different from ours, but resembles that in vogue in the hospital-schools of Paris. A clinic, medical and surgical, on the alternate days, is held in the wards of the hospital every morning at the early hour of 8 o'clock, before breakfast. During the hour from 8 to 9 a. m., the professor, attended by his class, passes through the wards, examines the patients, diagnoses the cases, prescribes for them, explains them in a familiar and pleasant way, and questions the students on practical points, taking notes of their aptitude and intelligence. These notes are referred to at the time of the examinations for appointment. After the clinical hour, a lecture is delivered in the amphitheater, from 9 to 10; generally a written discourse, which forms part of a regular series. Attendance on the clinics and on the lectures is obligatory, and all absentees are noted by the prévôt. After an hour's interval for breakfast, another lecture is delivered at 11 o'clock, and again at 3 o'clock in the afternoon; the intervening time being occupied by the labors of the dissecting-rooms and laboratory, or in reading in the library.

A weekly bulletin stating the hours for the lectures and the subjects is posted at the entrance to the hospital.

Cours.	Noms des professeurs.	Grades.	Jours et heures des cours.	Lieux où se font les cours.
Chimie médicale ; chimie toxicologique.	Fontaine	Pharmacien-en-chef	Lundi, mercredi, vendredi, à 8h, soir ..	Amphithéâtre de chimie.
Clinique médicale ; pathologie médicale.	Barrallier	Médecin-en-chef ..	Lundi, mercredi, vendredi, à 8 et 9h, matin.	Salle 3, amphithéâtre de médecine.
Clinique chirurgicale ; pathologie chirurgicale.	Barthélemy ...	Médecin professeur	Mardi, jeudi, samedi, à 8 et 9h, matin..	Salle 5, mphithéâtre de médecine.
Anatomie ; physiologie	Merlin	.....do	Lundi, mercredi, vendredi, à 11h, matin.	Amphithéâtre d'anatomie.

The appearance of the young men who are enrolled as students in this school indicates that they are of more than average intelligence and culture. There are about 120 in all, of whom 75 are in the second or junior class, and 45 in the first or senior class. The latter will compete for the appointment of assistant surgeon in August next. Out of the 40 or 50 examined every year in Toulon, a proportion of about 10 come up to the standard of requirement. The unsuccessful are allowed to remain another year under instructions, and to present themselves a second time for examination; but a second failure excludes them from the school and from the service.

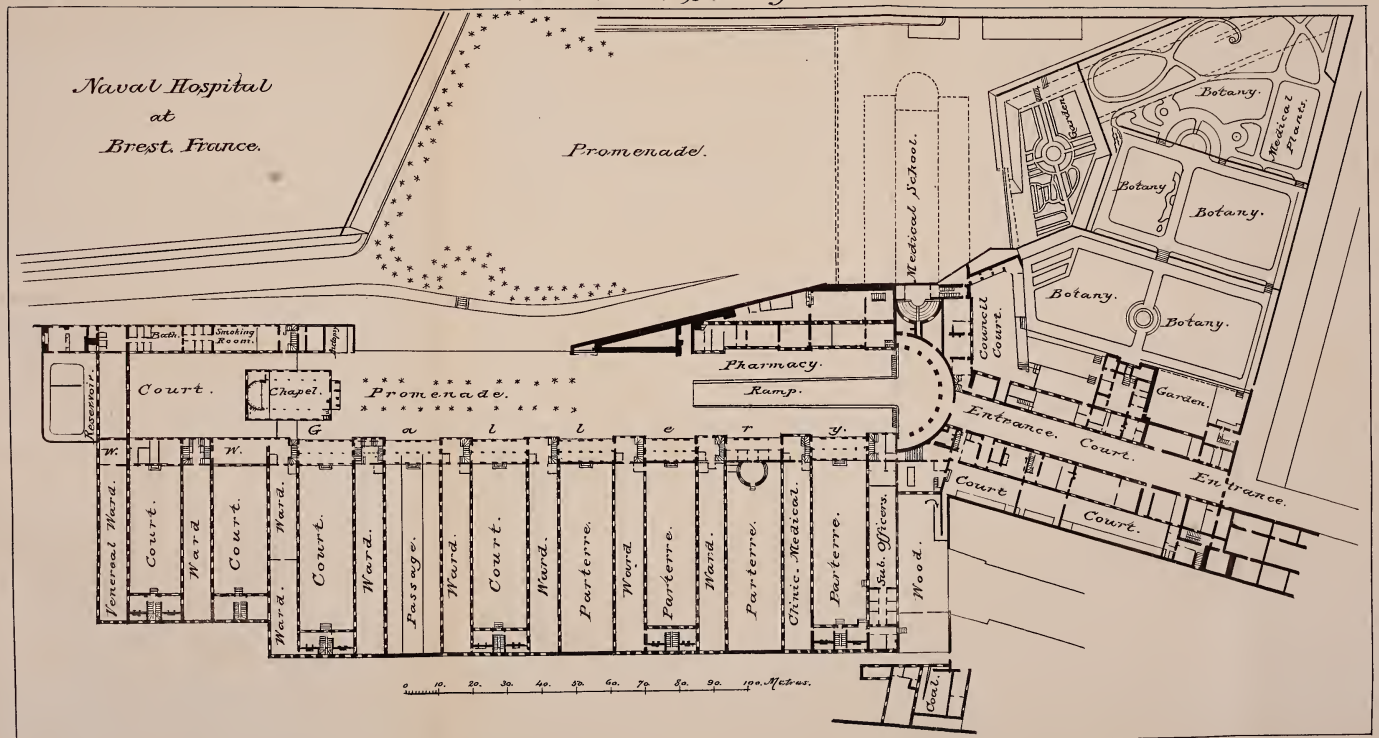
The annual examinations held at the three naval medical schools of Toulon, Brest, and Rochefort supply an average number of about thirty assistant surgeons, to fill the vacancies in the medical corps of the navy. Of those who enter the schools only about one-half are found to be remaining at the end of two years, when the time for examination has arrived. Of these, about one-fourth succeeds in the competition for appointment, so that it may be said, speaking in general terms, that only one-eighth of the students of these schools actually enter the service and become assistant surgeons. Promotion thereafter must be likewise won by passing an examination for each of the following grades, which comprise the organization of the medical corps of the French navy:

1. Inspecteur général.
2. Directeur du service de santé.
3. Inspecteur adjoint.
4. Médecin-en-chef.
5. Médecin professeur.
6. Médecin principal.
7. Médecin de première classe.
8. Médecin de seconde classe.

Coal.
Wood.
Medical School.

PLATE V.

Third Medical School of France.

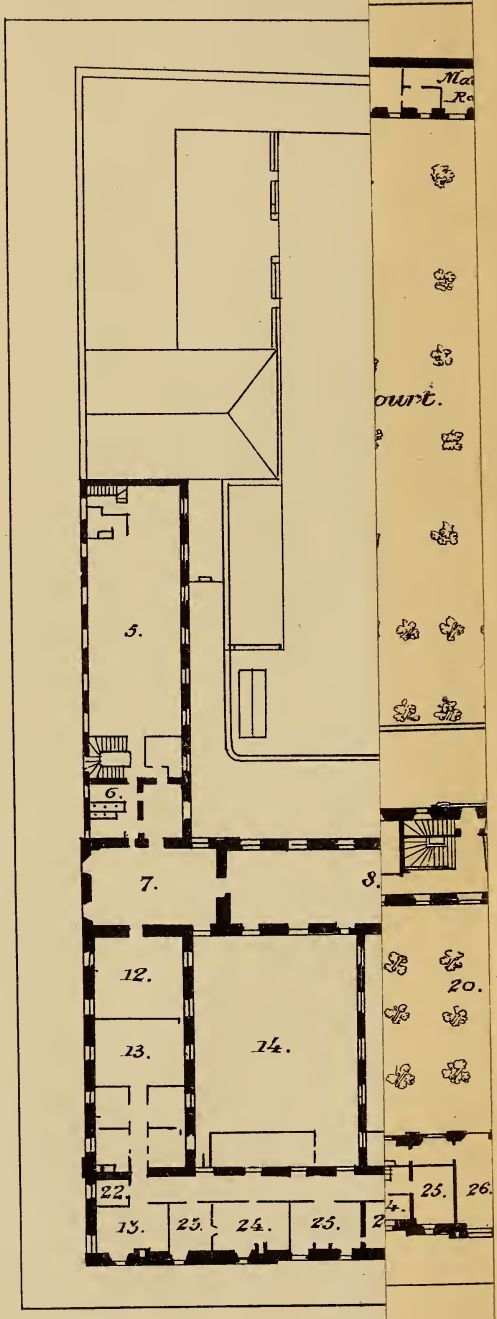


OBSERVATIONS

ON THE

NAVAL HOSPITALS OF TOULON, FRANCE.

PLATE. IV.



NAVAL HOSPITAL, TOULON.

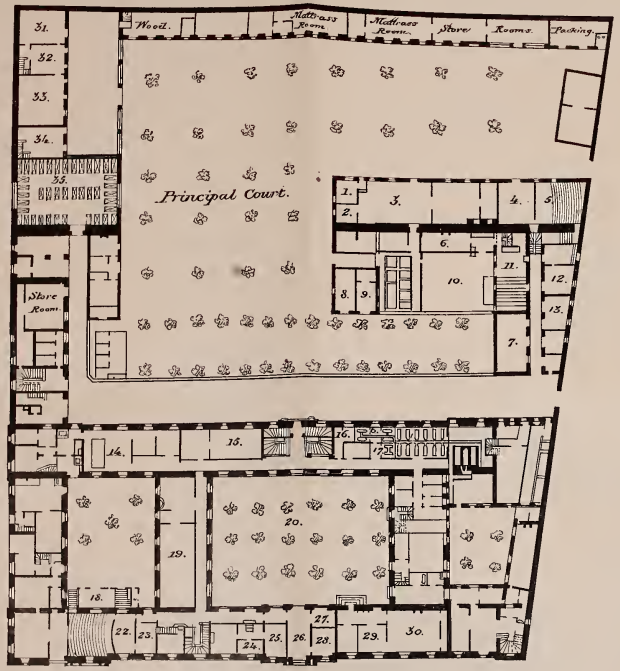
This ancient structure, like so many of the hospitals of Italy and France, was originally a religious establishment, having been founded by the Jesuits, in 1686, as a seminary for the almoners (priests or chaplains) destined for service in the navy, but has been used for its present purpose for more than ninety years. (Plates 3 and 4.)

Its locality, whatever it may have been at first, is objectionable at this time, being in the midst of the city, surrounded on three sides by narrow streets with high houses, and having on the fourth side an inclosure of limited dimensions.

The architecture is massive and plain, excepting the entrance, which is elaborately adorned with Ionic pillars, in pairs, supporting an entablature which is surmounted by two colossal figures representing Pity and Fortitude, holding between them a shield bearing the arms of France. Above these there is a sort of belvedere, which is used as an observatory. This central building is five stories in height, the wings being of three stories, or rather of two and a basement. As will be seen from the accompanying plans, it is built around two quadrangles, of unequal size, and a third inclosure of a trapezoidal form, the principal court being in the rear, and in a great measure occupied by the outbuildings and appendages. The exposure of the building itself is good, as it faces full to the south; but the interior is so injudiciously divided that the reverse is true of the wards, three of the principal ones on each story facing east and west, in closed courts, and two other large ones on each story looking north on one side and into a closed court on the other. The result of this arrangement is that but little direct sunlight ever finds its way into the rooms where the sick

Naval Hospital, Toulon.

PLATE III.



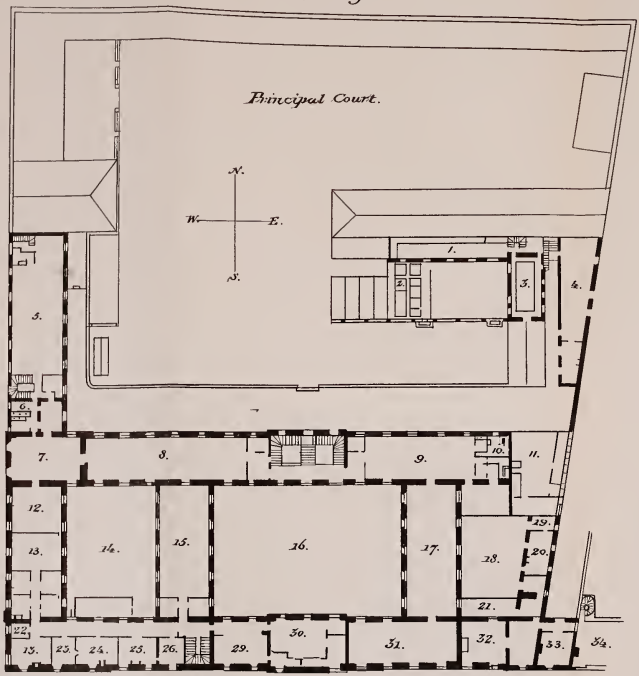
Plan of Basement.

1. Bureau of Pharmacy.
2. Office of Apothecary in Chief.
3. Laboratory.
4. Mortuary Chapel.
5. Anatomical Lecture Room.
6. Chemical Room.
7. Dissecting do.
8. Mineralogical Room.
9. Botanical Room.
10. Garden.
11. Chemical Lecture Room.
12. Dead Room.
13. Professor of Anatomy.
14. Cuisine
15. Linen Room.
16. Surgeon on Duty.
17. Baths.
18. Laboratory.
19. Grand Pharmacy.
20. Court.
21. Court of Sisters of Charity
22. Lecture Room on Practise of Medicine
23. Professor's Cabinet
24. Control.
25. Office of Entries.
26. Entrance.
27. Guard Room.
28. Sentries do.
29. Office of Director.
30. Council Room.
31. 32. 33. 34. Rooms for Arranging Linen.
35. Sleeping Room of Attendants.

Naval Hospital. Toulon.

PLATE. IV.

2nd Story.



1. Museum.
2. Basins for Leachers.
3. Lecture Room for Chemistry.
4. Anatomical Collections.
5. Ward.
6. Water Closets.
7. Ward.
8. Ward.
9. Ward.
10. Water Closets.
11. Store Room Pharmaceutical Utensils.
12. Room for Confinement of Patients.
13. Officers Room.
14. Court.
15. Ward. Medical Clinic.
16. Large Court.
17. Ward.
18. Court for Sisters of Mercy.
19. Pharmacy for the Sisters.
20. Chamber for the Sisters.
21. Gallery.
22. Office.
23. Salle a Manger.
24. Room for Pupils.
25. Superior Officers Room.
26. ..... do. ..... do. ..... do.
27. Cabinet.
28. ..... do.
29. Cabinet of Natural History.
30. Library.
31. Ward.
32. Chapel of the Sisters.
33. Room of the Sisters.
34. Superintendence.

are congregated. Only the chambers for the invalid officers and two small wards receive the southern sun. The advantage of additional coolness in summer cannot compensate for the loss, during the whole year, of the hygienic and remedial influence of sunlight. The capacity of the hospital is about three hundred beds, distributed in twelve wards and several private rooms.

The dimensions of the wards, 100 by 30 by 15, are sufficiently good, and approach the accepted standard; the number of beds in each ward is not in excess, seldom more than 24. The cubic air-space per man is greater than in most hospitals in Europe—1,875 cubic feet; but all of these good points are at once neutralized by the fatal fault of having the wards communicating by open arches, which has the effect of converting them virtually into one immense ward, in which a large number of sick breathe a common atmosphere, and are consequently subjected to all the evils of aggregation, (*e. g.*, wards 7 = 8 = 15, and 9 = 17 = 31 in the plan.) (See plate 4, ante.)

The floors of the wards are of glazed red tiles, of hexagonal shape, fitted closely together with cement, and form an almost completely non-absorbent surface. The walls are covered with lime-wash, which is renewed twice a year.

The ventilation is deficient; for, although each ward is provided with an abundance of opposite windows, six on each side, there is no movement of air in the narrow streets and closed courts on which they look, and the windows are not arranged so as to be kept sufficiently open. There is no artificial ventilation.

The heating of the wards is effected by stoves which burn wood, and furnish an agreeable, but irregular, temperature.

The beds are placed in opposite rows, two to each window, and are very comfortable and cleanly. The bedsteads are of wrought iron, with the *open* iron Rheocline springs, "like snakes sitting on their bottom coils," which allow the air to pass freely and directly under the mattresses. There are two of the latter to each bed, one stuffed with wool and one with hair, the woolen one being next to

the patient. They are frequently inspected, taken to pieces, cleaned, and made up anew, in a special room devoted to this purpose.

The latrines are adjacent to the wards, and separated from them by a narrow passage. They are automatic, and well arranged for cleanliness, but not for comfort or convenience. They are excellently ventilated by pipes leading up above the roof, and kept disinfected with chloride of lime. The drainage of this hospital is like that of all the buildings in Toulon; the refuse being conducted into open gutters in the streets, along which rills from a mountain-stream are made to flow rapidly, and empty into the sea.

Besides the wards, there are several very pleasant, cheerful, and sunny rooms for sick officers. They are warmed with open fireplaces, and furnished with every comfort.

The kitchen is spacious, well equipped, and provided with a large cooking-apparatus in the center of the room, thus securing a double amount of fire-space. It has communicating with it in a very convenient manner the butchery and store-rooms, and, all of these being under the exclusive control of the sisters of a religious order, it is needless to say they are in admirable condition. Instead of being isolated, however, it is placed in the basement of the main building, and directly under one of the largest wards, a plan attended with many disadvantages.

The laundry is at some distance from the hospital, and, in common with many others, is located on the banks of a small stream which descends from the mountains that environ Toulon, and flows through the city. I have not seen it, but am told it is like that of the civil hospital which I have visited, and with which I was greatly pleased. The water of the little river is allowed to run into and through several large tanks of cemented masonry, the curbs of which are of a convenient height for the operations of the washerwomen. Here the clothes are very readily washed and rinsed after having been boiled in copper caldrons near the tanks. They are then dried in the open air. This primitive but thorough establishment is also under the

management of the sisters, by whom the linen is afterward arranged with great care and taste in the linen-room of the hospital in open racks instead of closets.

The baths of the hospital are the most complete I have ever seen. They are in the basement, which appears an inconvenient disposition, as they are necessarily distant from the wards above. They embrace every variety of baths, cold, warm, douche, vapor, sulphur, and medicated, and are extensively used in the treatment of many disorders. Those intended for the use of officers are private, and fitted up in a superior manner. This department is the most advanced in the institution.

ORGANIZATION.

As the system of organization here is essentially different from ours, and as it is similar to that sanctioned by the usage of most of the continental hospitals of Europe, its consideration may be more instructive than the description of an obsolete edifice. The administration of the hospital is conducted by three different authorities, which are in a measure independent of each other, and the occasional jealousies between which are said to exercise a salutary influence on the interests of the sick:

1. The medical director, who has control over the medical staff and over all matters relating to the reception and treatment of the sick;

2. The commissary, who purchases all supplies, keeps an account of all the expenditures, and attends to the disbursements and financial transactions involved in the business of the establishment;

3. The sisters of the religious order which is charged with the duties of nursing, cooking, washing, and the general *ménage*, and with the care of the hospital property, (internal.)

While this arrangement curtails the authority, and, it may be, the importance of the medical officers, it has the advantage of freeing them from distractions and responsibilities in regard to things alien to their profession, while they have at the same time the assurance

that all the accessory duties are being well done by trained and competent persons.

The commissary, knowing the disinterested scrutiny to which his purchases will be subjected, is naturally more particular in their selection.

The sisters, who perform their offices as a religious duty and in conformity to a vow, and who do not and cannot receive any compensation for their services, are less apt to neglect the sick intrusted to their care than hired nurses, who obviously must belong to a class inferior in intelligence and morals.

These estimable women, who are thoroughly instructed in the art of nursing, have the superintendence of the wards; all the attendants being subject to their orders. They go about from bed to bed, hear the complaints and wants of the sick, and give them such help as they require. They also have the surveillance of the cellars and store-rooms, see to the preservation of the food, and that it is administered to the patients without alteration in quantity or quality, and report any deterioration to the commissary. They keep an account of expenditures, and dispose of such viands as may be remaining after the meals of the day; have charge of the linen-room and all the internal property and furniture of the hospital.

The police duties of the hospital are performed by the prévôt, who is a surgeon of the second class, assisted by three "garde-médecins," who are assistant surgeons under his directions. One of the latter is always on duty in a room of central location, ready to attend to any summons. They also receive the patients for admission. Marines are stationed as sentries and guards at the entrance and in the different courts.

As this hospital is designed for clinical instruction, all its arrangements are provided for the "service enseignant" as distinguished from the "service hospitalier simple." Attached to each clinic, both medical and surgical, is the following numerous and complete *personnel:*

1. One "médecin-en-cheif," who gives the clinical instruction, and delivers a course of lectures on the practice of medicine and pathology.

2. One surgeon of the first class, chief of clinic, who prepares the clinics for his superior, and replaces him in case of absence.

3. One surgeon of the second class, prévôt, and aid to the clinic, charged with the discipline of the assistant surgeons and students. He calls the roll and notes absentees, attendance on the clinics being obligatory.

4. From four to five assistant surgeons, who write the observations on the sick, and the remarks on diseases, in the clinical note-books.

5. From ten to fifteen students, who have charge of the dressings, and who write the memoranda of diet and medicines, and make copies for the apothecaries and for use in the kitchen.

Besides the above, there are in each ward:

6. One sister, who distributes the articles of food and diet, and administers the medicines which are to be given at particular hours, or for feeble patients. She also has the care of all the property in the wards, and the superintendence of the nurses, who are under her directions.

7. One apothecary of the second class, who prepares the prescriptions and attends to the extemporaneous pharmacy. He is assisted by a student of pharmacy.

8. One principal nurse, male, who administers baths, enemata, and performs offices unsuitable for a female. He has also the surveillance of the patients.

9. Two ordinary nurses, also males, who wait on the sick, make the beds, change the garments, &c.

There are three classes of persons entitled to treatment in this hospital: sailors from the ships and land-establishments of the navy, workmen in the arsenal, and soldiers from the garrison; the latter in consequence of the military hospital in Toulon being at present closed.

As with us, each patient receives a tepid bath before admission into the ward. He is then provided with a cotton or woolen cap, a shirt, a cravat, a loose capote of gray wool, pantaloons, drawers, and a pair of slippers, conducted to a bed duly numbered, and his name, disease, and antecedents entered on a "tableau de clinique," marked with a similar number, and on which the memoranda of his case are kept as long as he remains under treatment. These "tableaux de clinique" are, I think, more complete than our case-papers, to which they correspond. They embrace all the particulars of diet and medication, and have attached to them the tables of temperature and sphygmographic tracings. When completed, they are filed and placed in the archives of the hospital. As it is sometimes a matter of interest to compare the methods in which different persons do the same thing, I transmit one of these papers, accompanied by some notes of treatment of ordinary cases, one of pneumonia and one of typhoid fever.

The dispute existing in the United States and in England as to the relative advantages of treating pneumonia with or without blood-letting seems not to have extended to the south of France. Here, as of old with us, there is but one opinion, and bleeding is practiced in every case, both by venesection and by local depletion, and I must say, in most cases I have seen, with marked benefit. As a rule, the appearance of crepitation with a high temperature is the signal to take from the arm from one-half a pound to a pound of blood, and to cover the affected side with leeches; antimony being at the same time freely administered. A speedy fall of the temperature and resolution has generally been the result in cases thus treated under my observation here. In this connection, I will mention that the stethoscope used in this hospital is of the solid variety, and of a model contrived by Dr. Barrallier, professor of pathology and practice. Its peculiarity consists in its aural extremity being expanded into a flattened disk of about three inches in diameter. It is a rough-looking instrument, of light wood, but assists the ear better than any I have ever tried, con-

verting a muffled, whispering murmur into a clearly audible bruit. A specimen of it is herewith transmitted.

The management of typhoid fever here is extremely simple, and, I will also add, extremely unsuccessful. It may be, however, that the enteric fever at present endemic in the south of Europe is more than usually malignant and unmanageable. I am inclined to think that this is the case, as it appeared on board the Congress in a form that was absolutely "foudroyant." The adopted treatment at the hospital in Toulon is by enemata of cold water, cool lotions to the surface, a poultice over the abdomen, and the administration of quinine in tonic (1-grain) doses. (See report of case appended.) Stimulants and concentrated nourishment, as far as I can learn, are not employed, as especially required in the disease, though the alimentation of all the sick comprises more or less of the light Provençal wines, or those of Bordeaux. The poultice used is a great improvement over that made of linseed-meal or even of spongio-piline. It is composed of compressed cotton, mingled with some sort of fucoid plant, also dried and compressed. When placed in warm water, it swells rapidly, and retains most admirably both the heat and moisture. A small portion of this fabric is inclosed as a specimen.

The food supplied to the patients appears to be of excellent quality; and, its preparation being intrusted to the sisters, it is always well cooked. Bread, wine, soup or bouillon, fresh meat, poultry, and vegetables are the principal articles, and the scale of diet is arranged by a reduction in the quantity of each article, so as to form a three-quarter, a half, and a quarter diet. The light or fever diet consists of rice, tapioca, jelly, prunes, chocolate, and milk. Coffee is only given as medicine and tea is ignored. Much stress is laid on the appropriate use of the wines which enter into the allowance. They are carefully selected, and sent on a voyage before they are accepted at the hospital. The patients suffering from slight affections are given ordinary wine; but to those who are more seriously ill old and superior wines are administered. The convalescents receive a third and inferior kind.

It cannot but be regretted that an organization so admirable should

be compelled to exercise its functions in a building so imperfectly adapted to the treatment of the sick. Their skill and devotion must often contend in vain against the evil influences which oppose them. I know not what the rate of mortality is; but I am satisfied, from my own observation, that it is fearfully great. One incident which has occurred during my visit here will suffice to show the condition of things which prevails within its contaminated walls. A conscript, who had cut off the index-finger of the right hand to avoid service in the army, was brought to the hospital in a state of health perfect saving his insignificant injury. He was placed in the surgical ward, and within a week died with symptoms of typhoid poisoning. For nearly a hundred years, this edifice has had crowded into its unventilated wards numbers of diseased inmates until its very masonry is reeking with infection.

The ground has been chosen, and the plans prepared, for a new naval hospital to adjoin the arsenal; and, as soon as it can be completed, the one at present in use will be at once abandoned.

As the designs for this contemplated hospital have been made by Mr. Janvier, a distinguished architect of France, recently deceased, and may be supposed to represent the advanced ideas of what a naval hospital should be, I have endeavored to procure a copy to send to the bureau. By the kindness of Monsieur Raoulx, engineer-in-chief of the arsenals, who has charge of the construction of all the hospitals and barracks for the navy, I have been furnished with a small sketch of the ground-plan; and Dr. Fontaine, pharmacien-en-chef, at the school, has undertaken to photograph the other drawings for my use. The wards seem to be arranged on the same principle as those of the Vincennes military hospital, in double pavilions, placed opposite to each other; the intervening space at the ends being only partly occupied by accessory buildings, so as to avoid the stagnation of air in the angles. This hospital will be double the size of the one at Vincennes, and will contain nearly 1,200 beds, with about 2,600 cubic feet of air-space per man. The plan is attached to this report.

TYPHOID FEVER OF GRAVE FORM TREATED WITH ENEMATA OF COLD WATER AND EXTERNAL BATHING WITH OXYCRATE, (DILUTED VINEGAR.)

Lalondigue, Jean, a sailor on board of the Soiguelay, aged 22 years, entered the naval hospital, Toulon, during the term of service of the "médecin-en-chef," on the 24th of October, 1874.

24th October.—Has been sick for three days, and complains of pain in every part of the body, and especially in the lumbar region. Heat of the skin is intense. The thermometer placed in the axilla indicates a temperature of 41° Cent. The pulse is full and frequent, 92 per minute. The face is flushed, the mouth dry and pasty, and there is great thirst. The patient coughs a little, and expectorates some mucous secretion. Respiration is freely performed. Examination of the chest reveals a little dullness on the left side on percussion, and on auscultation some sonorous râles and a diminution of the vesicular murmur in the left lung, with some ægophony on the same side; nothing abnormal on the right side. There have been no evacuations of the bowels for two days. The abdomen is neither tender nor painful.

An emetic was administered in the beginning of the treatment.

25th October.—The night succeeding the entrance of the patient was uncomfortable, no sleep, and a good deal of disturbance toward morning; frequent evacuations of the stomach and bowels; abdomen painful upon pressure. Some gurgling could be heard in the right iliac fossa, and rose-colored spots appeared on the abdomen. The pulse was dicrotic, 96 pulsations per minute. The tongue was foul, the mouth very dry, the pupils dilated. On the left side of the chest were some sibilant râles. Cough. Axillary temperature 40° C.

Treatment was commenced at once, namely: a draught, with one grain of quinine, to be taken by spoonfuls every hour and at the same time an enema with 200 grammes of water, of the temperature of 15° C.

26th October.—Condition the same on the third day; the symptoms are rather aggravated. No sleep; a restless night. The patient complains of severe general pain in all parts of the body. The tongue is dry and red on the borders and point; the teeth and lips are covered with sordes; the abdomen is painful on pressure; five or six stools in the twenty-four hours; the pulse is full and dicrotic, 92 per minute; temperature 40.7° C.

Quinine again administered, and the temperature of the enema lowered to 8° C.

27th October.—Delirium declared itself on the fourth day. The face is red; the pupils dilated; the skin is warm and dry. The axillary temperature is 40.7°; the pulse is dicrotic, 88 per minute; the abdomen painful upon pressure, with numerous rose-colored lenticular spots. Six or seven liquid evacuations in the twenty-four hours.

Same prescription as in the night.

In the evening, the pulse is elevated to 96 per minute; temperature 40.9°. Repeat the enema of water at 8° C.

29th October.—Eight days after the invasion of the disease, the temperature is maintained constantly at the same elevation, (40°.7 C.;) the pulse at 96. The nights are restless; stools diarrhœal.

The temperature of the water given by enema is lowered to 5° C.

29th October.—The symptoms still more aggravated; the skin is dry and very hot; the pulse small and very frequent, 112 per minute; the tongue is dry, with burning thirst; the axillary temperature is raised still higher, 41.2° C.

Two enemata of water at 5° C. prescribed, and at the same time general bathing with oxycrate every three hours.

The temperature became lowered under the influence of the cold lotions, and the next day the pulse was only 104; temperature 40.°7 C. The night was calm; no delirium; five or six diarrhœal stools.

Same prescription; same lotions.

1st November.—The heat of the skin is still less intense; the thermometer does not indicate more than 39.7° C.; the pulse is 108.

Two enemata were prescribed: one with 200 grammes of red wine in the morning; the other in the evening with water at 5° C. Lotions every two hours, with a mixture of oxycrate and water, at 8° C.

2d November.—On this day and for some days after the temperature oscillated between 39°.7 and 40°.2 C., and the pulse between 100 and 108.

Same prescriptions.

7th November.—This morning the patient is more calm, and says he does not feel any pain. The pulse is 101, the temperature 39°.4 C. In the evening, there is extreme agitation; the skin is very hot; pulse 110, temperature 42.3° C.

General bathing with oxycrate, and two enemata with water at 5° C.

The next day, November 8, the pulse is still at 112, temperature 40.7° C.; but a remission occurred in the evening, the pulse became less frequent, and the temperature was 40.3° C.

9th November.—From the 9th to the 13th of November, very nearly the same temperature was maintained—39.4° in the morning and 40.2° in the evening—while the pulse oscillated between 99 and 104. The same treatment has been continued until the present time, the twenty-third day after the invasion.

13th November.—From the 13th of November, the temperature was not elevated above 39° C., the pulse becoming less frequent, and the patient more tranquil. The nights are quiet.

The enemata of cold water are dispensed with from this time.

18th November.—On the 18th, the patient complains of acute pain seated in the anterior and internal part of the right thigh, and on the posterior portion of the leg on the same side. There is no redness and but little swelling.

This pain continued during several days, but yielded to some friction with "huile de morelle," (nightshade.)

Convalescence is established. The patient, who, up to this time, has taken only liquid aliment, is now placed on half-quarter diet.

His appetite revives, his nights are good, and the diarrhœa diminishes.

29*th November*.—From the 29th of November up to the 2d of December, the patient was affected with profuse perspirations at night, which weakened him a little.

3*d December*.—From this date, the patient got out of bed every day in the ward; his strength returning little by little until his convalescence was fairly established.

On the 21st of December, he was given his discharge, and presented to the council of health for the purpose of obtaining a sick-leave.

NAVAL HOSPITAL OF SAINT MANDRIER.

The magnificent harbor of Toulon is divided by projecting promontories into two parts, the inner of which is known as the "lesser" and the outer as the "grand roads." On the southern shore of the latter, remote from the city and the arsenal, and the dense population which is crowded within their walls, is situated the famous hospital of Saint Mandrier. This noble structure, which is a monument of the wealth and power of France, as well as of the generous care she bestows on her sons when disabled in her cause, has been of immense service in giving succor to the sick and wounded on many occasions, both during the epidemics of cholera and plague by which Toulon has been frequently visited, and to the soldiers and seamen brought home from the wars in Algeria, the Crimea, and in Italy, and to those invalided from the colonies, especially from that most unhealthy region, Cochin China.

The splendid and stately edifice, beautiful as it is with its romantic surroundings, is nevertheless, according to the views of modern science, but indifferently suited for a hospital. To the conveniences of accessibility and safety from foreign enemies have been sacrificed other considerations of the highest sanitary importance, causing defects now greatly lamented by the medical officers attached to the institution. Had it been placed on the opposite side of the peninsula on which it stands, its situation would have been perfect in a sanitary sense; but, as it is, not only does it face to the north, but close behind it rise hills of such elevation as to cut off from it the direct rays of the sun during the most of the day. It is thus deprived of

the great natural advantages which have made this favored Provençal region so sought after as a residence for invalids, viz: The protection from the cold northern winds given by the Maritime Alps, and the full exposure to the pure sea-breezes and warm southern air of the Mediterranean. In the case of the hospital of Saint Mandrier, these are precisely reversed.

The building is composed of three isolated pavilions placed on the sides of a vast rectangular court, the fourth side of which is open toward the harbor and the opposite city. Each pavilion is three stories in height, three hundred and sixty feet in length, by about thirty feet in width, but the breadth is considerably increased by the addition of galleries which were built for the purpose of giving greater strength to the walls, and which now afford very convenient promenades under cover on all sides of the edifice. The floors are sustained by vaults or arches, and the whole building is of the most solid construction.

Saint Mandrier was planned by an eminent architect named Raucourt, in the year 1817. The execution of the design required immense labor in leveling and terracing the hill-side on which it is built, and this labor, as is the case with all the great works about Toulon, was performed by convicts. It was occupied for the first time in 1830.

It was scarcely finished before it was proposed to change its destination, some wishing to use it as an asylum—a sort of naval "Hotel des Invalides"—while others endeavored to have placed here the naval school of France. It was finally determined, however, to retain it for the purposes for which it was originally intended, that of a great receiving hospital.

The total capacity of all the wards, including those in certain temporary buildings, is about 1,300 beds.

The southern or central pavilion contains the administration, the pharmacy, the kitchen, the dead-house, the autopsic-room, cellars, store-rooms, &c.; and on the upper floors, wards for sick officers and

the quarters of the medical staff. There is also a very handsome council chamber in it, intended for meetings of commissions and for consultations. The two other pavilions are devoted exclusively to the use of the sick, who occupy all three floors. Connection is established between the upper portions of the different pavilions by light wooden bridges. The wards are 120 feet in length by 27 in width and 14 in height, and contain each 36 beds, arranged in opposite rows, two beds between each two windows. The air-space per man is somewhat more than 1,260 cubic feet.

The floors are of the same hexagonal red glazed tiles or bricks mentioned in connection with the Toulon hospital. These, being closely cemented together, form an excellent non-absorbent surface, easily cleaned, and agreeable to the eye.

The walls are of plaster, and lime-washed. The ceilings constitute a serious defect, as they are composed of numerous narrow arches, instead of a plain surface; thus affording too many receptacles for impure air and exhalations.

The ventilation is furnished entirely by the opposite windows and doors, assisted in winter by open fires; no artificial ventilation being employed.

The wards are heated by open stoves, burning wood, and placed at about the junction of the central and extreme thirds of the apartment.

The lighting would be ample, were it not that the external galleries make the rooms rather gloomy. It is obvious, from what has been said, that it is impossible for any rays of direct sunlight ever to reach any of the wards.

There are no water-closets, but perambulating close-stools make a convenient substitute, which are either used out in the galleries or at once taken there from the bedside, and the contents removed to a distant point and there buried. The same disposition is made of the other refuse matters.

The water-supply is derived from three enormous cisterns, with a

capacity of five millions of gallons. It is impossible to look at these colossal structures without admiration and astonishment. They are almost as extensive and as strongly built as those remaining on the site of ancient Carthage, and resemble the surviving works of a similar character left in many places throughout Southern Italy by the time-defying builders of Rome. Their reverberating echoes remind one of mighty caverns not made by the hands of man.

Beside the three great pavilions which form the hospital proper, there is another spacious building, of nearly 800 feet in length, originally erected to lodge the host of convicts who toiled for thirteen long years in the construction of these massive edifices. It is now used as a venereal hospital and to lodge the workmen employed in the botanic garden, and also contains the laundry and other offices.

The botanical garden formerly attached to the Toulon hospital has been removed to Saint Mandrier, and is a striking feature in the grounds which surround the institution. It is divided into six squares, four of which constitute the botanic garden in a strict sense, the fifth being a pleasure-ground, or "English garden," as they call it, and the sixth is a conservatory. The collection of plants is extensive and valuable, and is classified according to the system of Richardson. Here, as at Nice and Mentone, stately palm-trees grow in the open air, and it is a curious spectacle to see the great clusters of amber-colored dates ripening under a European sky.

In the midst of the garden there is a most beautiful chapel which presents a really classic appearance. It is of a circular form, surmounted by a cupola which is supported by a double row of columns, the inner ones being of the Ionic order, and the outer elaborate Corinthian. This chapel is reached by a lofty flight of marble steps and the floor is of mosaic, made of the various marbles found in the vicinity.

The organization of this hospital is so exactly like that of the sister institution previously described, that any account of it would be merely a repetition. The medical staff have charge of the treatment

and management of the sick, but have no further responsibilities connected with the establishment. The supplies are procured by the commissary, and the nursing and administering of medicine, as well as the cooking and washing, are exclusively in the hands of the sisterhood of St. Vincent de Paul, one of the principal orders of the so-called sisters of mercy.

I should be guilty of an unpardonable omission if in this connection I failed to make acknowledgment of the kindness and courtesy shown me by the officers living at Saint Mandrier. On the occasion of my first visit to the hospital, in company with Medical Inspector Gihon, at that time fleet-surgeon of the European squadron, the Directeur du Santé and the other highest officials crossed the bay with us, and spent many hours in personally conducting us throughout the whole of the extensive establishment and explaining the arrangement of the different divisions. In all of my subsequent visits I was invariably received with the utmost amiability and politeness by the resident medical officers, who with unwearying patience submitted to all my questionings and seekings after information. I was particularly struck with the intelligence and efficiency of the medical staff attached to Saint Mandrier, as well as with their absorbing devotion to their patients and their profession. I do not doubt that in courage and zeal they are the peers of those brave predecessors of theirs, nine of whom sacrificed their lives in succession in the wards of this hospital during an epidemic of cholera which scourged Toulon in 1835.

EDUCATION OF MEDICAL OFFICERS

FOR THE

PUBLIC SERVICE IN ENGLAND.

WASHINGTON, D. C., *March* 21, 1876.

SIR: Agreeably to your instructions of the 19th of June, 1874, I have the honor to transmit herewith a report of the special duty assigned me in Europe.

Having been informed that in the month of October, 1875, a class of candidates would be examined at the Army Medical School, Netley, for commission as assistant surgeons in the army and navy, I procured permission to proceed to England, with a view of being present at the examination, and making myself acquainted with its scope and character; intending to visit, at the same time, the various military and naval hospitals of Great Britain.

Regarding this as probably the most important part of my duty, on my arrival in London I presented to General Schenck, the minister of the United States, the letter of introduction with which I had been provided by the Department of State, with the request that he would obtain for me the sanction of the proper authorities to visit the institutions referred to in an official capacity. The desired permission was very kindly given in a note from the Foreign Office, of which the following is a copy:

"The Earl of Derby presents his compliments to General Schenck, and, in reply to his note of the 11th instant, has the honor to acquaint him that the necessary instructions have been given for affording every facility to Dr. R. C. Dean to visit the military hospitals at Woolwich and Netley; and that every facility will be afforded at the several naval hospitals to enable that officer to obtain such information as he may require, upon his official application.

"Foreign Office, October 19, 1875."

Feeling that I could now prosecute my investigations to advan-

tage, I proceeded to Southampton, and found that my visit was expected, and that all of the officers of the hospital as well as of the Army Medical School were prepared to aid me in every way. Previous experience having taught me that but little knowledge of value is to be obtained by formal visits, and by merely walking through an institution and receiving explanations from officials, and that the best way of acquiring information of a useful sort is to become associated in some manner with the establishment to be examined, and to make regular and daily observations, I adopted the plan of going through the wards of the hospital every morning with the students and instructors, and afterward attending the lectures delivered by the professors to the candidates, and witnessing the analyses, autopsies, microscopic examinations, and other practical operations. The great courtesy and friendliness of the professors attached to the school enabled me to do this without embarrassment and in a way entirely agreeable to myself. Besides the information thus derived from my own observations, much supplementary knowledge was imparted to me by the various officials of the institution, who felt much interest in my mission. They all, indeed, seemed gratified by the fact that the Department desired information concerning the school, and very kindly referred to the circumstance in their lectures as an honor to them; such allusions being also received by the candidates with demonstrations of applause. This feeling was no doubt in a great measure due to the fact, which I observed with much pleasure, that the medical authorities of the United States are held in high esteem here; no other authors being more frequently cited, or spoken of with more respect in the course of these lectures.

I do not doubt that I should have been able to procure much information that would have been of interest to the bureau in regard to this admirable school had it not unfortunately happened that, just as I was beginning to feel myself becoming acquainted somewhat with its organization and management, I was suddenly recalled to the Congress by a telegraphic order which compelled me to depart so

abruptly that I was obliged to leave much of my task unfinished. The imperfect character of the accompanying report must be attributed to the untimely interruption of my observations, which frustrated to a great extent the object of my mission.

I need scarcely say that after having traveled so far, with this special object, and taken so much pains in advance, it was a profound disappointment to me, to be prevented from realizing the important results I had hoped for from my visit to England.

Very respectfully,

RICHARD C. DEAN,

Medical Inspector United States Navy.

Surgeon-General J. BEALE, U. S. N.,

Chief of the Bureau of Medicine and Surgery,

Navy Department.

EDUCATION OF MEDICAL OFFICERS FOR THE PUBLIC SERVICE IN ENGLAND.

It cannot be otherwise than instructive to those who aim to improve the condition of the Navy, to examine and compare the systems adopted by different nations for the education of the medical officers, to whom is intrusted one of the most important interests of the state, that of maintaining the health and consequent efficiency of its armies and fleets.

In England, attention has been directed in a special manner of late years to this subject, and many wise reforms have been made, which have extended the duties of medical officers of the army and navy into new spheres of usefulness, ameliorated greatly the life of the soldier and the sailor, and secured for the government an increased amount of service from an unaugmented force.

It is somewhat remarkable that in a country so conservative such radical changes should have been accomplished in so short a time, and a brief reference to the agencies by which they were effected will not be alien to the purposes of this report.

That this was a question demanding the grave consideration of the government had been represented by many intelligent officers and writers whose views had weight in influencing opinion, and especially by Robert Jackson, by Sir J. Ranald Martin, physician to the council of India, and by Dr. Parkes.

In the concise language of the latter, it was declared that "the state employs a large number of men whom it places under its own social and sanitary conditions. It removes from them much of the self-control with regard to hygienic rules which other men possess, and is therefore bound, by every principle of honest and fair con-

tract, to see that these men are in no way injured by its system. But more than this, it is as much bound by its own self-interest. It has been proved over and over again that nothing is so costly, in all ways, as disease, and nothing is so remunerative as the outlay which increases health, and, in so doing, increases the amount and value of the work done."

At the same time that a better hygienic status of the army and navy was being advocated as a measure of expediency, the moral and humane aspect of the question was being most forcibly and successfully presented by arguments equally potent.

Both public sentiment and parliamentary action seem to have been influenced in a great measure by the earnest exertion of two persons, whose names will be forever associated with the cause of humanity, Lord Sydney Herbert, Her Majesty's Secretary of State for War, and that noble woman of England whose life has been one long devotion to the relief of suffering. How well their labors are now appreciated by a grateful people may be seen in the splendid structure erected at Woolwich, the "Herbert Military Hospital," the most suitable memorial, and the most perfect institution of the kind in Europe, and by the fact that the name of Florence Nightingale is never mentioned without reverence throughout the length and breadth of the land.

In consequence of the efforts referred to, a royal commission was appointed in 1857 to inquire into the sanitary condition of the army of England. "A new system of regulations was prepared by this commission, which entirely altered the position of the army medical officer. Previously, the army surgeon had been intrusted officially merely with the care of the sick, though he had naturally been frequently consulted on the preservation of health and the prevention of disease. But the regulations of 1859 gave him an official position in this direction, as he is ordered to advise commanding officers in *all matters affecting the health of troops*, whether as regards *garrisons*, *stations*, *camps*, and *barracks*, or *diet*, *clothing*, *drill*, *duties*, and *exercises*."

"The commission also recommended that, to enable the army sur-

Plate VI.

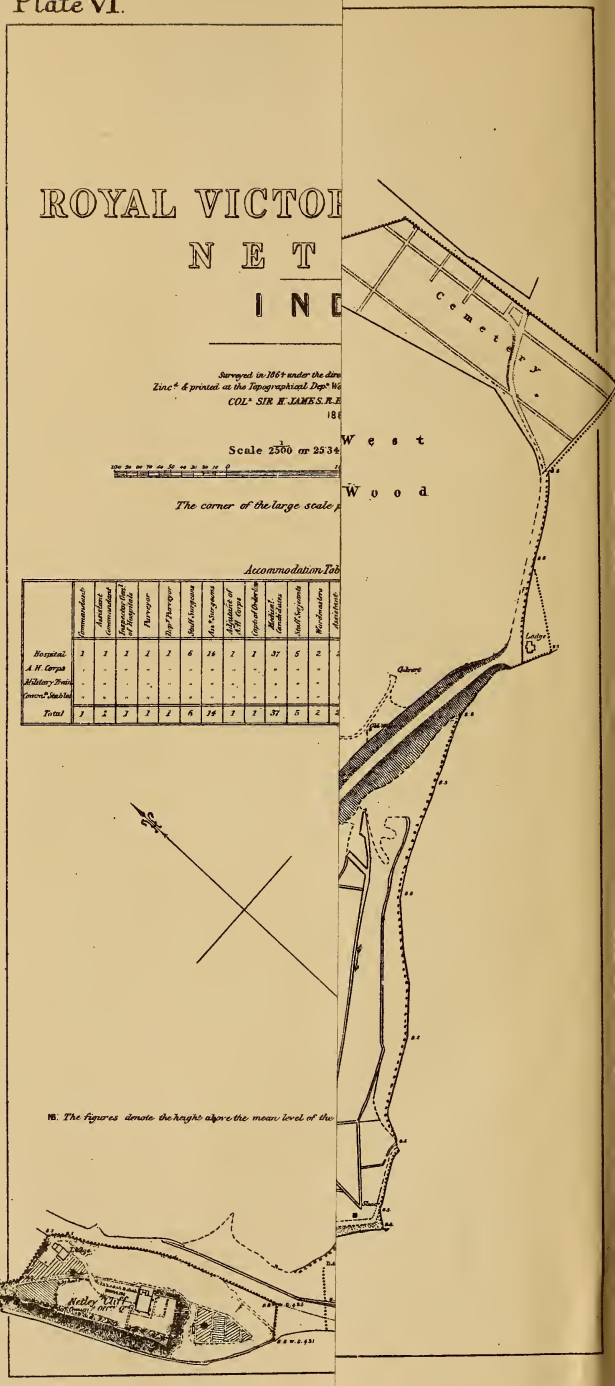
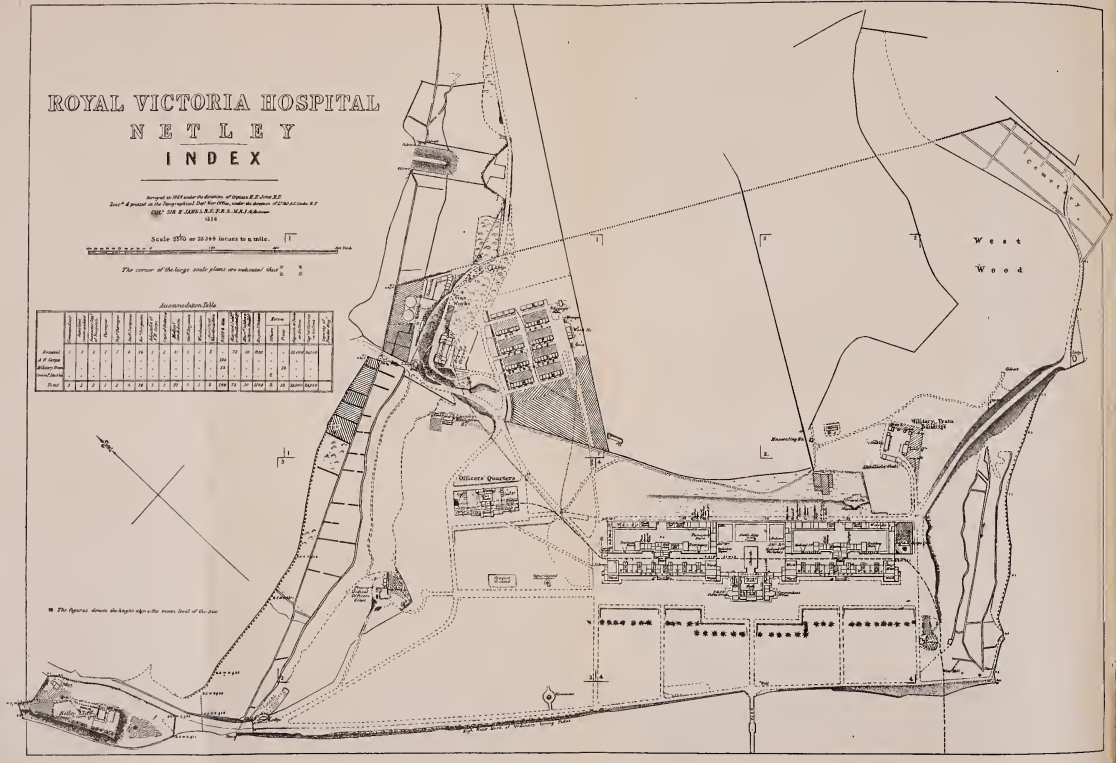

ROYAL VICTOR
N E T
I N D
Surveyed in 1861 under the dire
Zinc.d & printed at the Topographical Dep.t Wo
COL.d SIR H. JAMES R.E
18
Scale 1/2500 or 25
West
Wood
The corner of the large scale p
Accommodation Tab
Commandant
Assistant Commandant
Inspector Genl of Hospitals
Purveyor
Dep.t Purveyor
Staff Surgeons
Ass.t Surgeons
Apothecaries of Hy Corps
Asst of Chaplains
Medical candidates
Staff Nursing
Wardmasters
Assistant
Hospital
A.H. Corps
Military Prison
Convict Establ.t
Total
Cemetery
Lodge
Quarry
Kedley Point
Lodge
15. The figures denote the height above the mean level of the

Plate VI.


ROYAL VICTORIA HOSPITAL
NETLEY
INDEX
Officers Quarters
West
Wood

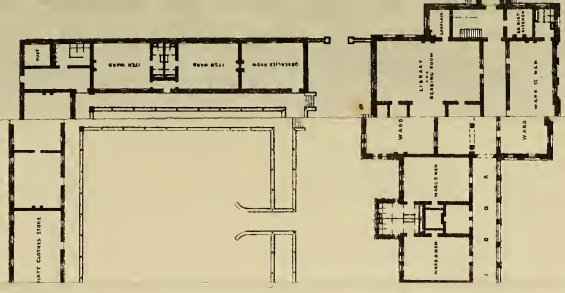
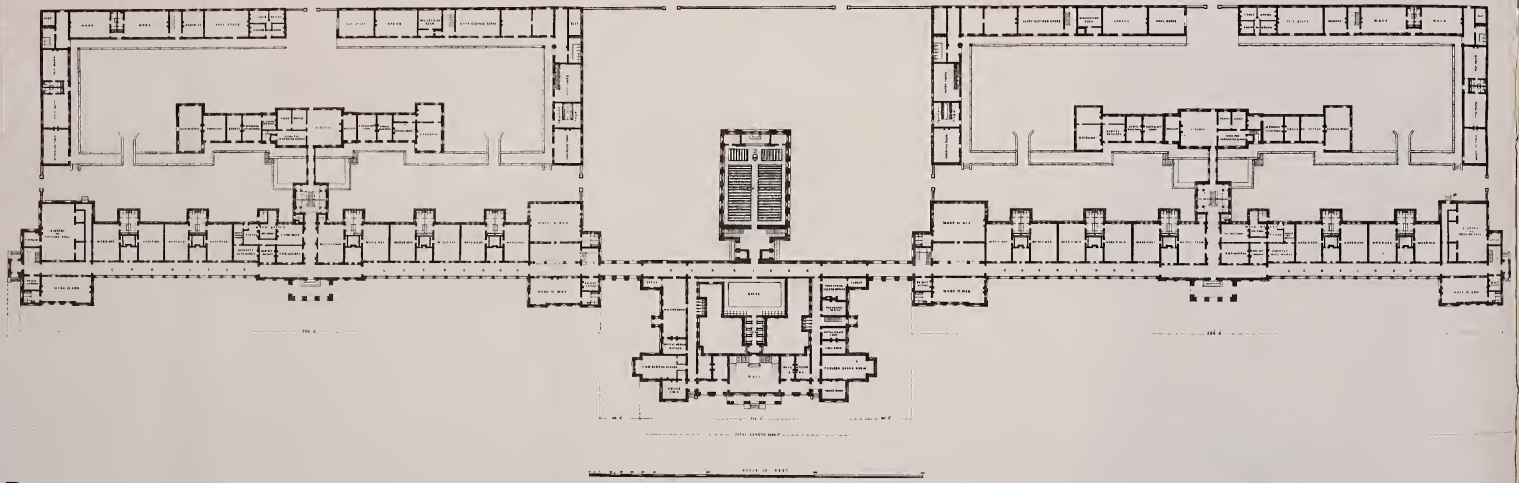


Plate VII.

ROYAL VICTORIA HOSPITAL

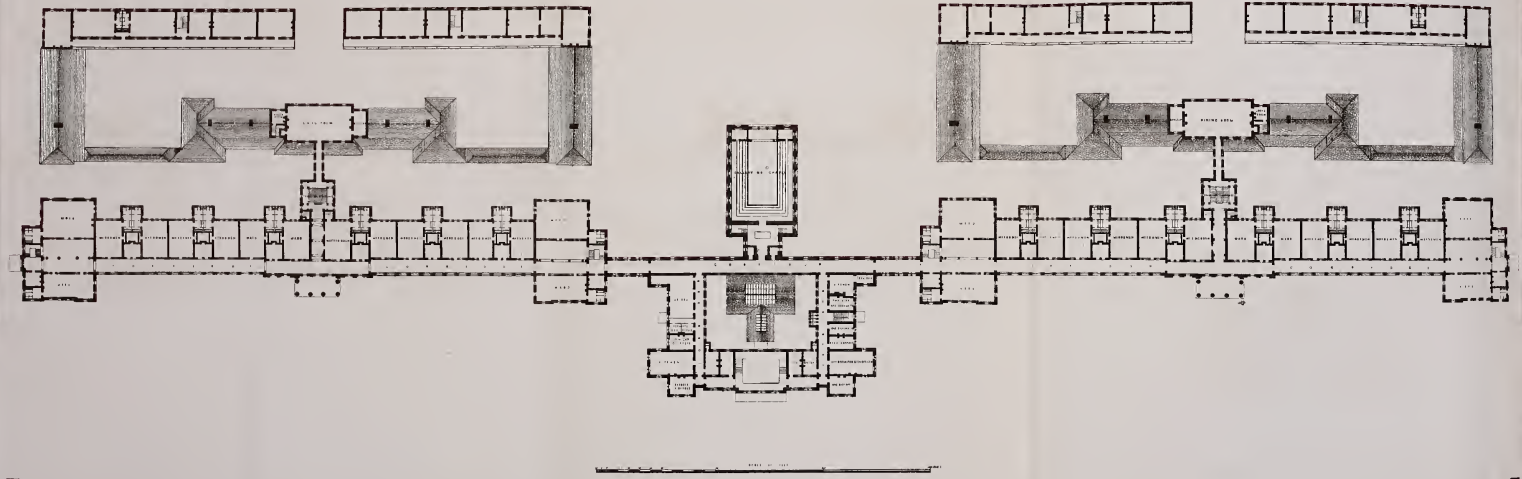
GROUND PLAN



Transferred from a Drawing by Geo. and printed at the Ordnance Survey Office Southampton
under the Direction of Col. Colby C.B. Major Genl. R.E. F.R.S. &c. &c. Superintendent

ROYAL VICTORIA HOSPITAL

FIRST FLOOR PLAN



ROY

geon to do this efficiently, an *army medical school* should be established, in which the specialties of military medicine and surgery, hygiene, and sanitary medicine might be taught to the young medical officers of the army." (Parkes.)

The prosecution of these views led to the foundation of the now celebrated army medical school at the Royal Victoria Hospital at Netley. (See Plates VI, VII, VIII, and IX.)

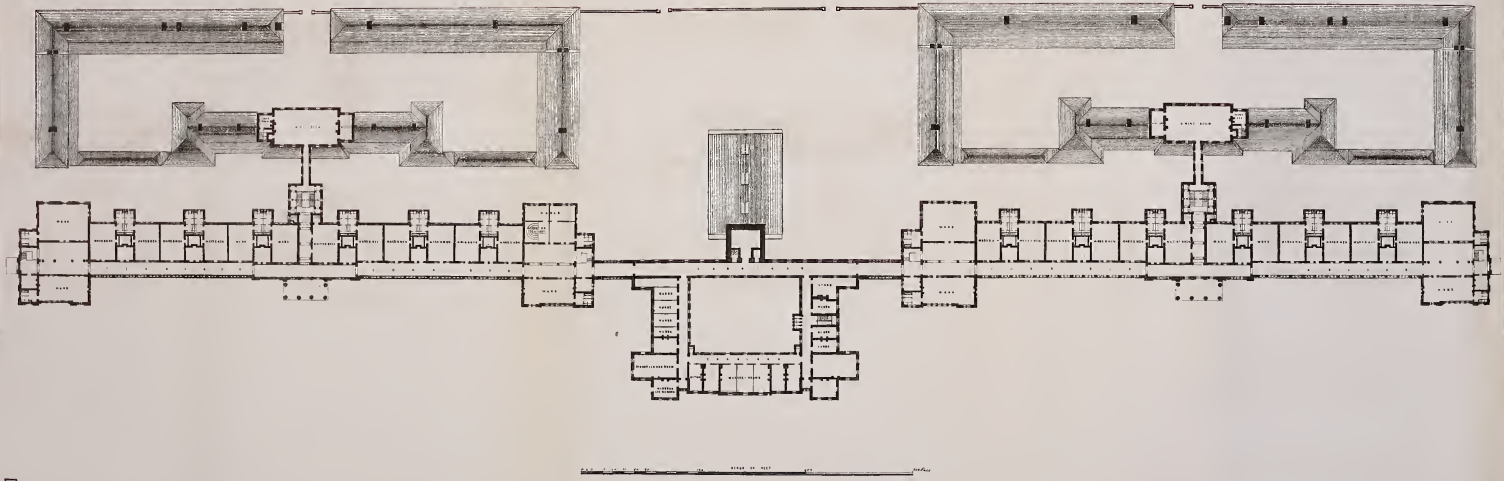
It is a significant fact that the establishment of this school was deemed by the commission the first step necessary to effect "an improvement in the sanitary condition of the army," so that the institution may be said to have sprung from the requirements of an enlightened military administration, and to have been designed to assure to the state a class of medical officers of a high order of competency.

But although it was on the recommendation of the royal commissioners that the army medical school was finally organized, the idea of such a school by no means originated with that body. It was Dr. John Bell, a distinguished surgeon and teacher of Edinburgh, one of a name and family that have given many honored members to the medical profession, who, seeing the low state of surgical knowledge among the naval surgeons of the fleet when he visited their hospitals at Yarmouth, after the battle of Camperdown, first called the attention of the British government to the necessity of establishing what he called a "great school of military surgery." The effect of this memoir was the establishment of the "military surgery chair" in the University of Edinburgh. The first occupant of that chair was Dr. John Thomson, who was appointed in 1806, and was succeeded in 1822 by Sir George Ballingall, an army surgeon of experience, and author of the well-known "Outlines of Military Surgery." In the year 1805, Dr. Robert Jackson, often styled the "Prince of Army Surgeons," published his excellent treatise on the "Medical Department of Armies." In this work, Dr. Jackson unfolded an elaborate scheme for "an army medical practical school," which he proposed to establish in connection with the invalid depot in the Isle of Wight. The plan of this

Plate IX.

ROYAL VICTORIA HOSPITAL

SECOND FLOOR



famous army surgeon was in all essential particulars the same as that laid down in the present constitution of the army medical school; this remarkable man having on this, as on so many other subjects, ideas in advance of the age in which he lived. The only step taken in this matter, until after the Crimean war, was the establishment of another chair of military surgery in Dublin. This and the corresponding chair in Edinburgh were finally abolished when the army medical school was organized in 1860.

The institution was first placed at Fort Pitt, Chatham; but, in 1863, the Royal Victoria Hospital was opened at Netley, and to it were removed the school, the pathological museum, and the two libraries connected with the medical department of the army, as it was believed that young medical officers would have there better advantages for the study of disease.

The results of the system were found to be so satisfactory that in 1872 it was extended to the naval service; and candidates for the medical departments of the army, navy, and India services are now all required to receive here a supplementary education before being commissioned for actual duty. Officers of the royal engineers can attend the lectures on military hygiene, if they so desire; and combatant officers have the same privilege. All medical officers of the army and navy have access to the school.

ORGANIZATION.

Although located in the hospital, the medical school is not an appendage of it, but has a separate and independent existence under the Secretary of State for War. Its affairs are directed by a "senate," which is composed of—

The medical director-general of the army, president;

The physician to the council of India;

The professors of the school;

The principal medical officer of the hospital.

This body is invested with the power of regulating the amount and

character of the instruction, rules for the conduct of candidates, and methods of discipline, and controls the expenditures of the institution. Its acts require the approval of the Secretary of State for War.

The object of the school being to give practical training in such branches only as will qualify the officer for his special sphere, the course is limited to the four subjects of—

Military medicine;
Military surgery;
Military hygiene;
Pathology.

Military medicine is taught clinically in the wards of the hospital. Special attention is given to investigating the history of the cases under observation, and to the forming of careful and accurate diagnoses by means of the stethoscope, laryngoscope, ophthalmoscope, microscope, chemical tests, &c.; and candidates are required to examine men in the presence of the professors, to familiarize them with the processes of invaliding and recruiting. The management of hospitals, the art of nursing, diets in disease and convalescence, and the preparation of medical records and sick-certificates are all included in this part of the course. A series of lectures is also delivered by the professor of military medicine on the principal diseases to which soldiers and seamen are liable, and these lectures are made to embrace various collateral subjects, such as the history and literature of military medicine, the peculiar features of military and naval life with reference to morbific exposure, &c. Detailed accounts are given of tropical diseases, especially of yellow fever, malarious affections, dysentery, and cholera, and of the different epidemics which may attack armies and fleets. Medical management by means of change of climate, in convalescence from sickness, and in cases of health impaired in insalubrious countries, and the methods of making medical inspections of troops and crews of ships to discover incipient or threatened disease, are explained at length. Lectures and clinical instruction are also given in *mental diseases*.

Military surgery is in like manner taught practically in the wards and by lectures. The latter are very comprehensive, and embrace, besides the usual subjects of surgical anatomy, inflammation, wounds, and operations, instruction in the various methods of transporting sick and wounded men, the fitting-up of transports and hospital-ships, use of ambulances, examination and classification of invalids, proportion of medical and surgical appliances to corps and divisions in different climates, surgical arrangements in landing on an enemy's coast, on taking the field, during and after an engagement, with an advancing army and with an army in retreat, with a besieging force, trench duties, and when within a besieged town or port. *Dental and ophthalmic surgery* are also included in this course, and the instruction in the use of the ophthalmoscope is given by the professor of military surgery.

The lectures on *pathology* are delivered in connection with the study of the valuable specimens in the museum illustrating the morbid anatomy of the more important diseases incident to military and naval life; and practical instruction is given in the making of autopsies and necroscopic examinations, in the distinguishing of effects of disease from post-mortem changes, in the determining of the weight and bulk of organs, membranes, and fluids in health and disease, the normal and abnormal capacities of cavities. Practical instruction in the use of the microscope also pertains to this chair, as well as the art of drawing microscopic and other morbid specimens.

But the most marked feature of this admirable school is undoubtedly the *department of hygiene*, which stands unrivaled by any other similar institution in Europe or America. The instruction given here is of a character unique and precious, and is, in my opinion, the most advanced exponent of modern military medicine in its broadest and most comprehensive sense. So vast is the field and so manifold the subjects treated of in this division that it would almost seem as though it should be a school in itself. Rapid, concise, but systematic and thorough, teaching is given in the whole principles of hygiene and

their application to military life in every aspect and relation. The great work, of which the professor of military hygiene here is the author, is nominallythe text-book; but the range of instruction transcends that of this invaluable volume, and reaches to most of the acquirements of finished medical scholarship. In addition to the daily practical exercises in the routine branches of hygiene, interesting information is imparted on such collateral or allied subjects as the comparative healthiness of different races, and their mental and physical adaptability to military and naval service; influence of climate on health and life; acclimatization; geographical distribution of disease and mortality over the surface of the earth; influence of malaria; effects of emanations from animal matters on health; relations of disease to overcrowded surfaces; defective drainage as predisposing to epidemics; the science of ventilation; accounts of animals from which food can be derived; relative value of meats dried, smoked, salted, and fresh; marks of disease in animals; signs of wholesome and unwholesome meat; the art of cooking; nutritive value of various grains; adulterations of flour; examination of green vegetables used for food; the sources, collection, storing, and distributing of water; clothing; vital statistics; transmissibility of disease; influence of light on health and disease; epidemic influences; plans of hospitals; burial of the dead; and many other subjects of the greatest practical importance.

In consequence of the great amount of labor involved in the instruction of this department, it is intrusted to two teachers, a professor and a conjoint professor of hygiene, who are aided by a third, with special reference to naval hygiene.

FACULTY.

The faculty of the school is composed of three medical officers of the army, one medical officer of the navy, two professors not connected with either branch of the service, and several assistants. As these gentlemen are well known to us by reputation, and by their ex-

tensive contributions to medical literature, it was with much interest that I found myself brought into contact with them, and given the opportunity of making their personal acquaintance.

Surgeon-General T. Longmore, C. B., the professor of military surgery, is an officer of prepossessing personal appearance and manners, an agreeable as well as an instructive lecturer, whose discourses bear evidence of the widest experience and research, and whose opinions are evidently the result of much philosophic thought. The numerous orders and medals worn by him attest the appreciation of his merits by his government.

I was fortunate enough to be present during his lectures on the important subject of "Gun-shot Wounds of the Head." The views he expressed as to the treatment of such injuries were sustained by a remarkable array of facts drawn from a variety of sources.

He deprecated the use of the trephine, or the probe, or any attempt to extract the projectile when lodged in the brain, and cited the experience of the most eminent surgeons in the Peninsular, Crimean, Italian, and Franco-Prussian wars, who were unanimous in their opinion as to the evil results of such an interference. He stated, at the same time, most frankly that the numerous and valuable cases so ably reported by American surgeons during the war of the rebellion went far to establish the contrary, and that, out of respect to them, he would defer any positive statement of a precept until after the completion of the publications from the office of the Surgeon-General of the Army of the United States. I have been impressed with the fact that, although Professor Longmore's ideas are quite at variance with the usual practice in this country, they have been curiously borne out by the reports of the first case of the kind which has been brought to my notice since my return. It is interesting to observe that the theory of defense in a recent trial of a well-known citizen of New Jersey should have affirmed the principle that the fatal injuries were more likely to have been caused by the frequent use of the surgeon's probe than by the bullet which had entered the brain of the deceased.

This theory was entirely supported by the necroscopic appearances; the ball having been found *encysted* in the brain only one and a half inches from the external wound, while probes and catheters had been three times passed a greater distance into the brain, once as far as two and a half inches. A corresponding number of abscesses were found in the posterior right lobe of the brain, which were believed to have been the immediate cause of death.

In these lectures, Professor Longmore advocated the adoption of a common classification of gun-shot wounds, to be used by all nations, so as to avoid many difficulties which now exist in comparing the accounts of different authors. While he holds it to be unimportant whether the primary division be made into "regions," and the secondary into the character and complications of the wounds, or the converse, he thinks it very desirable that the same classification should be used by all writers. He said he had found a ready assent to his proposition from European surgeons, but not from those of the United States, who preferred to retain their own system.

Deputy Inspector-General W. C. Maclean, C. B., is an officer in the prime of life, and of a commanding stature and presence, with a countenance strongly indicative of his Scottish origin. He is a native of Argyleshire, and a genuine type of the Highlander. He resides in Southampton, where he is a citizen held in high esteem. His lectures are forcible and eloquent, and enriched by the gathered incidents of a vast and varied experience, especially in India, and are delivered with the peculiar but impressive accent of that northern race, which has ever held a foremost place in the ranks of the medical profession.

A coincidence sufficiently remarkable to be noted occurred in connection with his course while I was present at Netley. In a discourse on diseases of the liver, he stated to the class that, according to his observations, abscesses of that organ were more frequently evacuated into the lung than externally or into the stomach or bowels. Almost at the moment of this statement being made, a patient in one of the

wards died from the rupture of a hepatic abscess into the lung, and the autopsy, attended by the class after the lecture, furnished an illustration never to be forgotten.

The most interesting lectures on military medicine delivered during my visit were those on yellow fever; and I was particularly pleased to hear from Dr. Maclean himself the admirable account of the two forms of the disease, long confounded, as I knew he had been, if not the first, among the earliest to point out the distinction between them. The clear differentiation given in Aitken's works between the true specific yellow fever and the resembling malarial fever was furnished by Dr. Maclean, and the tabulated differential diagnosis between the same two diseases published in the report of Deputy Inspector-General Donnet, of the royal navy, to the admiralty, though more concisely and conspicuously stated, and, doubtless with equal originality, was subsequent to that of Dr. Maclean.

In reply to some inquiries I made as to the success of the cinchona forests planted on the Nilgherry Hills of India, I was informed by Dr. Maclean that they had prospered beyond expectation, and that the yield of yellow bark was now very abundant from them, and of a quality equally rich in quinia with that of the Loja region in South America. For the purpose of placing this useful remedy within the reach of the poorer classes, the plan has been adopted of treating the bark with muriatic acid and other solvents of the cinchona alkaloids, and without going to the expense of separating the quinia, using the whole of the unpurified mixture of alkaloids without refining, which had been found a very efficient anti-periodic, and could be furnished in India at the cost of a shilling a pound!

Considerable use was also being made at Netley of the salicylic acid, made in Germany by synthesis at a very economical cost, as an anti-periodic remedy in intermittent fevers. The results were quite satisfactory.

The proprietor of an empirical remedy, known as "*Warburg's Tincture*," came to Dr. Maclean just before my arrival, and made

known to him the composition of the medicine, and also prepared some in the laboratory of the hospital. As it had been found promptly efficacious by many of the English army surgeons in India and elsewhere as a remedy in malarious fevers when everything else had failed, much curiosity was felt to ascertain its ingredients. The following is the formula as given me by Dr. Maclean:

Aloes Socotrin. ℔ j.
Rad. Rhei,
Sem. Angelicæ,
Confection. Damocratis, *āā* ℥ iv.
Rad. Helenii (Enulæ),
Croci Sativi,
Sem. Fœniculi,
Cretæ Preparatæ, *āā* ℥ ij.
Rad. Gentianæ,
Rad. Zedoariæ,
Pip. Cubebæ,
Myrrh.,
Camphor.,
Bolet. Laricis, *āā* ℥ j.
Alcohol., gall. iv.

Digest for twelve hours, strain, and add
Quiniæ Sulphat., ℥ x.

The "Confectio Damocratis" is a combination of thirty aromatic substances, formerly officinal in the London Pharmacopœia, and still made by English druggists, and the "Boletus Laricis" is an active cathartic, not officinal. The dose is one-half ounce, to be repeated in three hours. It is probable that such a heterogeneous mixture as this will be regarded as a curiosity rather than anything else; but notwithstanding its singular and apparently absurd composition, I was assured by Dr. Maclean that it had invariably proved in his hands by far the most prompt and effective and reliable remedy in remittent

and intermittent fevers he had ever known, and that the experience of many eminent army surgeons coincided with his own. It is referred to in "Reynold's System of Medicine," and its composition has since been published in one of the English medical journals with the warmest recommendations of several distinguished physicians and surgeons. It may be worth remembering in the treatment of those numerous cases of malarious fevers in which quinine alone proves insufficient. It has, at all events, the merit of being recommended by the highest authorities, after personal experience in its use, and has been well spoken of by Sir James Gibson, (medical director-general of the army,) Sir Andrew Halliday, Dr. Babington, and Mr. Skey.

Both the military medical officers above mentioned, by virtue of their position as professors in the army medical school, enjoy an advanced rank, and have been made "Companions of the Most Honorable Order of the Bath."

Dr. Aitken, whose invaluable work on the practice of medicine has given him such wide renown, is also one of the many distinguished men whom Scotland has given to the medical profession. His lectures on pathology are replete with learning, and would do high honor even to the great school of Edinburgh, where, from his characteristic accent, one might fancy them to be delivered.

In one of his discourses he spoke in complimentary terms of the practitioners of the United States, and made quotations from Drs. Hartshorne and Clymer, whom he referred to as high authorities.

I had the privilege of spending a very profitable hour with him in the Pathological Museum, in conversation and in the examination of his most interesting specimens. He is a very modest and unassuming man, and, from his retiring manners, I infer that, unlike his military colleagues, he has always led a life of seclusion and study. His instruction in the pathological room, where the microscopic examinations of morbid tissues are made, are considered especially valuable, as there each individual student receives personal attention from him, and his vast information is imparted in an informal and colloquial fashion.

Dr. Parkes, the professor of hygiene at Netley, was convalescing from an attack of illness and from the effects of a fall during my visit; but, notwithstanding that his disabilities obliged him to walk with two canes, he persisted in daily attendance at the school, and in superintending the arrangement of the tasks and practical work in his department, for the candidates. He has much quiet dignity, with a sweet and gentle face, which attracts everybody to him. His amiable character and conciliating manners have made him greatly beloved by the students, as well as by all who know him. He resides at "Bitterne," one of the pleasant little English villages on the line of the railway from Southampton to Netley, which has been constructed for the accommodation of the school and hospital. He is a member of the board of examiners in London for the examination of candidates for admission into the army, and a Fellow of the Royal Society. As a medical man and a man of science he stands high in the estimation of the English people, and I have heard him spoken of with both admiration and affection by many army medical officers, in various parts of the world.*

Surgeon-Major F. De Chaumont, R. A., is the conjoint professor of military hygiene, and gives lectures and practical instruction in the laboratory most useful in its character.

Staff-Surgeon J. Denis Macdonald, M. D., R. N., a Fellow of the Royal Society, is assistant professor of hygiene, and instructor in all matters relating to naval hygiene and service afloat.

Each professor has an assistant professor appointed to aid him in the work of instruction. These appointments are for five years, except in the case of Dr. De Chaumont, who, on account of his very special qualifications, has been appointed conjoint professor for permanent duty.

SYSTEM OF INSTRUCTION.

Five days in the week are devoted to instruction; Saturday being a sort of "dies non," on which there are no lectures. Generally

*Since the above was written this eminent man, to whom the world certainly owes much, has died, lamented by the entire nation. A message of kindest sympathy was sent him in his last hours by the Queen.

not more than two lectures are delivered each day, the remainder of the time being occupied by clinical instruction in the wards, in the laboratory, in the microscope-room, museum, or libraries. Candidates are required to remain in the wards from 9 o'clock to 11.30 a. m. Attendance on the lectures is also compulsory, and the class is expected to be assembled before the hour of lecture. No excuse is received for non-attendance excepting duty elsewhere, or leave of absence granted by the proper authority. The penalty for being late at lectures is the loss of 10 marks, and that for absence the loss of 25 marks; these numbers being deducted at the end of the term from the aggregate of marks by which relative position is assigned. An examination is held at the end of the session on the subjects of the lectures, and the marks obtained are consulted in arranging the places of the candidates on the list of assistant surgeons when commissioned for service in the army or navy.

The manner of conducting the instruction in the *laboratory* is extremely practical and thorough. On the two occasions on which I was present, the subjects under consideration were the testing of air for impurities and the examination of flour to discover adulterations. For the former purpose, the professor caused air to be collected in suitable vessels from three different localities external to the hospital, and also within the room where the students were gathered. He then described the processes of analysis intended to be used, giving formulæ and illustrations on the blackboard, after which each candidate was required to perform the analysis and write the result on a tablet. The calculations were then reviewed and compared, and errors corrected when existing. Every candidate is provided with a separate desk and shelf, furnished with the chemical reagents and apparatus necessary in such examinations, and does his work without consultation with his companions. Constant practice of this kind soon gives skill in manipulation, and I observed that the analyses seemed for the most part accurate, and received the commendations of the professor. In the second instance, after the various methods

of testing the quality and purity of flour had been recounted, each candidate was furnished with a sample of flour, and required to make the analysis and reduce the results to writing.

In like manner, examinations are made of water, wines, beer, vinegar, fabrics used in clothing, various soils, and everything pertaining to the sanitary science of military life.

In this connection I will state that I have had numerous occasions to witness the truly valuable services which the medical officers educated here have been enabled, by their special training, to render, not only to the garrisons and ships to which they were attached, but also to the whole community in which they lived, by the inspection of animals, the analysis of meat, determining the wholesomeness of air and water, &c.—duties of the greatest usefulness, which cannot, as a general rule, be performed in so practical a way by members of the medical profession. At Gibraltar and Malta especially, where large garrisons are stationed, these duties are regarded as of the highest importance.

In the *pathological room*, the practical instruction is managed in the same way. Every candidate is provided with a microscope, and is exercised in the examination of tissues and morbid products, as well as in the drawing and measuring and preserving microscopic objects. All the class is required to be present at every post-mortem examination.

MUSEUM.

The museum is well suited for its purpose, and contains many interesting specimens of pathology, illustrating the diseases of tropical climates, wounds from various projectiles, results of operations, &c. Perhaps the most valuable portions of it are the complete collection of parasites which produce disease, its ethnological specimens, and the models of hospitals and apparatus for the succor and transportation of wounded men.

LIBRARIES.

Two libraries furnish to the students the works of standard authors in medicine and science, and a pleasant and commodious reading-

room gives every facility for the examination of prints and the consultation of maps and charts.

During the period of his attendance at the school, every candidate has an allowance of five shillings a day, and is furnished with quarters in a handsome building erected for the purpose near the hospital. The mess-room and parlor are spacious and comfortable apartments, and all the arrangements, as in every English military mess, are complete and perfect.

With kind and courteous hospitality, Colonel Gordon, the commandant of the post, and Surgeon-General Fraser, the principal medical officer of the hospital, invited me to become the guest of the mess during my stay, and to occupy rooms in the officers' quarters, besides showing me many friendly attentions, such as cultivated Englishmen know so well how to bestow in their homes. There were under instruction, at the time of my visit, about sixty students, most of whom were candidates for appointment in the army and navy, the remainder being intended for the India service, and some few being medical officers already in the service, but improving their knowledge of the specialties taught in such a thorough manner at this school. They seemed to be intelligent and cultivated young gentlemen, the material of which good officers are made.

EXAMINATION OF CANDIDATES.

The subject of the examination and qualifications of candidates for commission in the military and naval service of England is naturally connected with the consideration of the school where their professional training is completed. The system does not differ greatly from our own, but presents some features of special interest. Like our own, the examination is a competitive one. Every candidate desiring to present himself before the examining-board must be *unmarried*, and must be not under 21 or over 28 years of age. Attested evidence of the date of birth must be furnished. Satisfactory certificates of moral character must also be produced. The candi-

date must himself certify that he is free from any mental or constitutional disease, and from any disability which could interfere with the performance of his duties as a medical officer under all circumstances. He must also pledge himself willing to engage in general service immediately. He must have a diploma in surgery, and a degree in medicine, or a license to practice it in Great Britain or Ireland.

The examiners by whom the preliminary examinations are conducted are not, as with us, medical officers of the army or navy, but are four medical men connected with the University in London, who hold their sessions for this purpose at convenient times, generally between the courses, at Netley.

The examination is upon the following subjects:

Anatomy and physiology.
Surgery.
Practice of medicine.
Therapeutics.
Diseases of women and children.
Chemistry.
Pharmacy.
Operations on the cadaver.
Application of surgical apparatus.
Clinical medicine.
Comparative anatomy. }
Zoology. }
Botany. }

The three latter are not indispensable, but are considered in determining the relative position of successful candidates, a list of whom, arranged in the order of merit, is prepared by the board, and transmitted to the director-general of the army, and by him communicated to the professors of the Army Medical School.

The marks given to each candidate on each subject are attached to his name on this list, to be used in a manner hereafter described.

It is not the practice in England to assemble an army medical

board and a naval medical board; but the preliminary examinations for both branches of the service are made by the same board.

The four members who constitute this board, as at present organized, are—

Mr. Busk.....Anatomy and physiology.
Mr. Pollock.....Surgery.
*Dr. Parkes.....Medicine.
Dr. Thomson.....Zoology.

These gentlemen have no connection with the military or naval service.

The plan of the examination resembles that in France, and differs from our own in the important respect that the same questions are submitted to all the candidates who are to compete with each other.

I am indebted to Surgeon-Major Webb, R. A., assistant to the professor of military medicine at Netley, who kindly procured them at my request, for the examples of the preliminary examinations held in London in 1874 and 1875.

Preliminary examination of candidates for Her Majesty's army, navy, and Indian services, London, August, 1874.

ANATOMY AND PHYSIOLOGY.

1. Classify the various kinds of articulation, and give an instance of each kind. Notice also those which illustrate the different forms of lever.

2. Give the origin, course, relations, and distribution of the glosso-pharyngeal nerve, and describe the dissection required to expose it in its course below the base of the skull.

3. Enumerate the different kinds of glands that are found in the small and large intestines, and describe their minute structure and the physiological functions assigned to them.

4. Give the dissection required to expose the supinator brevis muscle, and mention, in the order in which they appear, the parts that must be removed.

* Since deceased.

5. How would you proceed to ascertain the presence of urea and sugar in the blood?

6. Describe the cochlea, its osseous structure, its membraneous portion, and the way in which the cochlear division of the auditory nerve is distributed.

SURGERY.

1. Describe the symptoms of concussion, the result of a fall or blow on the head. What subsequent symptoms might arise which would lead to an unfavorable prognosis, and upon what conditions would such symptoms depend? State the treatment of a case of concussion.

2. A man has general enlargement of the testicle. State the symptoms which would indicate that it was a case of medullary cancer, strumous disease, or one of simple chronic inflammation.

3. Describe the general and physical signs by which rupture of lung may be diagnosed in a case of fracture of the ribs, and the treatment to be pursued in such a case.

4. Describe the symptoms of traumatic gangrene supervening on compound fracture of the leg; and the treatment, both general and local.

5. What are the earliest evidences of strumous disease of the hip-joint in a child? What treatment, local and constitutional?

6. Mention the common forms of inguinal hernia in infants of both sexes. What treatment should be adopted in a case of undescended testicle in child the subject of inguinal hernia?

MEDICINE.

1. What are the chief pathological changes in the serous membranes? Give the symptoms of inflammation of the pericardium and of the peritoneum, and state what are the causes of these affections.

2. State what is meant by the following terms, and what are the conditions in which the sounds referred to are heard: venous hum; mitral obstructive murmur; aortic regurgitant murmur; pulmonary murmur; sound of a cracked pot; crepitation; metallic tinkling.

3. Describe fully a case of chronic Bright's disease commencing insidiously and terminating by uræmia, and the probable causes and presumed pathological changes going on in the kidneys.

4. Describe the following cutaneous eruptions: Sudamina, herpes zoster, urticaria, rupia, psoriasis, guttata, pityriasis.

5. What are the principal astringents? Give the chief pharmacopœial forms and doses of each drug you name, and state in what diseases it is principally employed.

6. What are the chief causes of menorrhagia and dysmenorrhœa? Give the treatment in each case.

ZOOLOGY.

1. To what order of mammals does the genus Felis belong? Give its characters, enumerate its principal species, and state their geographical distribution.

2. State in general terms the structure of the eye in the different classes of the animal kingdom.

3. Describe the nature and mode of growth of the horn in the order "Ruminantæ."

4. To what class of animals does the genus Helix belong? Give its most important characters, and describe its respiratory and generative organs.

5. Describe the wings of birds, bats, and flying squirrels, pointing out the homologies of their parts.

6. What use do birds make of the force of gravity in propelling themselves through the air, and by what means is the movement of "soaring" accomplished? Describe the wing of the eagle with reference to the mechanical powers employed in its action.

BOTANY.

1. Explain the terms epiphite and parasite, and give an account of the different kinds of parasites in plants.

2. Give the characters of the natural order of "Orchideæ."

3. What are the most important useful products yielded by the natural order Leguminosæ? State the name of each, and the part of the plant from which it is obtained.

4. What are the most important characters of algæ, lichens, and fungi?

5. How do you distinguish between volatile and fixed oils? By what orders of plants are the most important forms of each yielded?

PHYSICS.

1. What is meant by the term specific gravity? Describe the nature of the processes by which it can be determined in solids, liquids, and gases.

2. Explain the nature of vinous and acetous fermentation.

3. Explain the terms equator, ecliptic, tropic, latitude, and longitude, and state the causes of the differences of temperature in the northern and southern hemispheres, and in the torrid, temperate, and arctic zones.

4. Explain the causes of the differences of climate on the eastern and western coasts of America, Europe, and Asia.

5. What is the geographical distribution of the chalk formation? Give the general characters of its fossils, and explain the mode in which it has been formed.

Preliminary examination of candidates for Her Majesty's army, navy, and Indian medical services, 1875.

ANATOMY AND PHYSIOLOGY.

1. Describe the parts contained in the space circumscribed by four lines corresponding with the borders of the masseter muscle, in the order in which they are seen in a dissection from the surface to the mesial line.

2. Give the origin, course, and relations of the *profunda cervicis* artery, and the dissection required to display it on the posterior aspect of the vertebræ, noticing the parts exposed in the dissection.

3. Name the nerves supplying the following muscles: Obturator externus and internus, glutæus maximus, opponens pollicis, supinator radii longus, flexor longus digitorum and pollicis.

4. Describe the mechanism of the heart's action, the sounds attending it, and the causes to which they are assigned.

5. Give a general account of the lymphatic system, including the minute structure of the lymphatic vessels and glands.

6. Point out the distinctive characteristics of the male and female pelvis, and state the average dimensions of the outlet in both sexes.

SURGERY.

1. Describe the local and general symptoms of acute inflammation of the knee-joint, the result of an injury. What changes would occur in the external and internal tissues of the joint if the case progressed unfavorably? Describe the treatment in each condition.

2. State the symptoms by which an impacted fracture of the neck of the thigh-bone may be distinguished from fracture within the capsule without impaction, and the treatment in both cases.

3. What character of tumor is usually found in the region of the parotid gland? Describe its structure and the difficulties in its removal.

4. State the most frequent causes of suppuration of the internal ear, its results and complications, and treatment.

5. Describe the symptoms by which rheumatic iritis may be distinguished from syphilitic iritis, and the treatment of the latter.

6. A man has been wounded by a bayonet in the lower third of the inside of the thigh, the result of which is recurrent arterial hæmorrhage. Describe the treatment to be adopted.

MEDICINE.

1. What is meant by the terms pyrexia and hyperexia? How is the temperature of the human body best measured? How can the high temperature of pyrexia be reduced?

2. What conditions of the heart may produce anasarca? Describe fully the cardiac physical signs, and give the treatment.

3. How is ascites caused? Give the treatment in each case.

4. Give the symptoms and treatment of diabetes mellitus, and state what is known of its pathology.

5. How do you ascertain the existence of pregnancy? What is meant by the term "complicated labor?" How would you treat a case of foot-presentation?

6. What medicines are supposed to act on the liver, and what are the reasons for supposing they do so act?

ZOOLOGY.

1. Give the characters of the class "fishes," and of the orders into which it is divided.

2. Describe the structure of the sea-urchin and star-fish, and state their position in the animal kingdom.

3. To what order of insects does the ant belong? Give the character of the genus, and describe the economy of an ant-hill.

4. What is the meaning of the term "alternation of generation"? In what animals does it occur? Describe its nature.

5. What animals have poison-producing organs? Describe their position and structure in each case.

6. Mention some of the animals belonging to the "Cetacea," and state what is known of their habits.

BOTANY.

1. Give the characters of the natural order "Gramineæ," and describe accurately the structure of the flower and seed.

2. What is meant by spontaneous generation, and what are the experiments and observations which have been made to prove or disprove it?

3. Give the characters of the genus "Chara."

4. Explain the terms capsule, berry, drupe, achene, pod, legume, follicle, and give examples of each taken from British plants.

5. What are stipules? In what natural orders do they occur?

6. Describe some of the plants which are supposed to be nourished in part by animal substances as food.

PHYSICS.

1. In what form does carbon occur in nature, pure and in composition?

2. What is the nature and composition of the atmosphere? Describe and explain the structure of the barometer.

3. Describe the solar system, and state the relative position of the planets, their periods of rotation, and their distances from the sun.

4. State the modern view of the nature of heat and its relation to light.

5. What is a volcano and what is the distribution of volcanoes on the earth's surface?

6. What is the ultimate origin of the force which moves a tide-water mill?

The foregoing examples, which are all I could obtain, may serve to indicate the character of the first examination which the candidates are required to pass. It does not seem as rigid or as comprehensive as that for admission into the medical corps of our Navy; but it must be remembered that this examination is in every sense preliminary, and that success before the board in London does not entitle the candidate to any other privilege than that of attending the Army Medical School, where he is obliged to remain during an entire course of practical instruction of not less than four months before being admitted to his examination for his commission. The latter is conducted by the professors of the school, and, though confined to fewer subjects, is more practical and difficult. As the questions submitted at this second examination are prepared by the most distinguished medical officers of the army and navy, and by two physicians of the highest reputation, Drs. Aitken and Parkes, the examples of them which have been forwarded to me from England will possess a special value.

Examination of candidates for commission in Her Majesty's army, navy, and Indian medical services, at the close of the twenty-eighth session of the Army Medical School, Netley, July, 1874.

MILITARY HYGIENE.

PROFESSOR E. A. PARKES, M. D., F. R. S.

1. If you are called upon to examine whether the ventilation and the sewerage arrangements of a house are sufficient, to what points would you direct your attention? Full details are required as to quantity, movement, and purity of air, and as to examination of drains, traps, &c.

2. What diseases are supposed to be connected with imperfect ventilation or defective sewerage of houses? What are your views as to the reality of this connection?

3. What are supposed to be the physiological influences of climate? And what part do these influences play in the production of diseases?

4. What is the usual length of marches for infantry soldiers, and what are forced marches? *What are the points to be attended to in order that the greatest amount of work may be got out of the soldier with the least chance of injury to him?* What are the diseases that may attack an army on the march?

NAVAL HYGIENE.

STAFF-SURGEON J. D. MACDONALD, R. N., M. D., F. R. S.

1. *Describe the situation of the prison-cells in an ordinary ship, stating the usual means adopted to secure their ventilation, and the manner in which you would inspect them as to their fitness for the reception of prisoners.*

2. State also the system on which the magazines are ventilated at present, and what improvement you would suggest in respect to it.

3. Describe the framing of double bottoms in iron ships, stating the direction in which currents of air will pass most freely, and how their compartments may be efficiently ventilated before workmen enter them.

PATHOLOGY.

PROFESSOR WILLIAM AITKEN, M. D., F. R. S.

1. Describe the conditions of the bones of the human skeleton as to completeness of ossification from the ages of seventeen to twenty-five.

2. Define (according to the London College of Physicians) the term *primary syphilis*, and name its varieties; also the terms *secondary syphilis*, *tertiary syphilis*, and *hereditary syphilis*. Describe also the pathology of the induration of syphilis, and the parts which become indurated.

3. Describe in detail the method of removing the viscera of the thorax, and parts therewith connected, as practiced at the post-mortem examinations; and describe the usual incisions to expose the cavities of the heart, stating the reasons for making the incisions in the way you describe.

MILITARY SURGERY.

SURGEON-GENERAL T. LONGMORE, C. B.

1. A soldier is wounded in the upper arm by a rifle-shot, and the humerus is fractured:

(*a*) What conditions of injury would induce you to amputate the limb?

(*b*) State your reasons for considering amputation necessary under the conditions you have named.

(*c*) Assuming a case of comminuted gunshot fracture of the humerus in which you decide to try to save the limb, what will be your course of treatment?

(*d*) What serious complications may arise in the course of the treatment of such a case?

2. Answer the same questions as above, but suppose the gunshot wound to be in the forearm, and the radius and ulna to be the bones fractured.

3. Presbyopia and hypermetropia; explain the difference. A presbyopic patient requires + 24 spectacles to see clearly small letters 8 inches from the eye; where is his point of near vision without spectacles? What is hypermetropia equal to $\frac{1}{40}$?

MILITARY MEDICINE.

SURGEON-GENERAL W. C. MACLEAN, M. D., C. B.

1. Give a definition of acute congestion of the liver; contrast it with passive congestion, arising from obstruction of the circulation. The etiology, symptoms, diagnosis, and treatment of this affection are required.

2. Describe suppurative inflammation of the liver under the following heads:

(*a*) A careful diagnosis between inflammation of the gland and its capsule;

(*b*) The causes which give rise to pyæmic abscesses of the gland, including symptoms and treatment;

(*c*) The etiology of true suppurative inflammation;

(*d*) The symptoms, with a clinical analysis of each;

(*e*) Signs of suppuration, with similar analysis;

(*f*) Number and position of possible abscesses, with the symptoms indicative of the position of the different varieties;

(*g*) Points of discharge, indicating those which expose the patient to the least danger;

(*h*) Nature of pus in the different varieties;

(*i*) Condition of the urine before and after suppuration;

(*k*) Treatment.

Examination of candidates for commission in Her Majesty's army, navy, and India medical services at the close of the twenty-ninth session of the Army Medical School, Netley, February, 1875.

MILITARY HYGIENE.

PROF. E. A. PARKES, M. D., F. R. S.

1. What are the chief causes of contamination of air in houses? Mention briefly the modes of preventing the air from the ground and from the sewers getting into houses.

2. What are supposed to be the methods of spread of enteric fever, typhus, scarlet fever, and cholera? And what are the principal methods of prevention in each case?

3. What part does phthisis play in the mortality of the army at home and in India? What can be done to reduce the mortality?

4. What do we mean by climatic diseases and diseases of deterioration? Mention the chief conditions favoring the existence of each class; and state how far acclimatization seems possible for Europeans in India.

NAVAL HYGIENE.

DR. J. D. MACDONALD, F. R. S., STAFF-SURGEON R. N.

1. In case of an epidemic of yellow fever breaking out on board ship in the West Indies, what steps would you take—

(*a*) To cut short the epidemic;

(*b*) To disinfect the ship?

2. Mention the various localities on board ship in which vitiated air, and, in particular, the products of respiration and organic impurities, chiefly accumulate.

State also the manner in which the starboard and port watches are berthed in their hammocks so as to obviate the effects of overcrowding at night.

PATHOLOGY.

PROFESSOR WILLIAM AITKEN, M. D., F. R. S.

1. Describe how the lungs are best prepared for microscopical examination. Name the parts and structural elements which are to be

recognized, and the reagents most suitable. Describe the morbid structural changes that may be seen microscopically in the lungs.

2. Name the bones of the skeleton still unfinished, as to growth and union of epyphises, at 20 years of age.

3. Name the "continued fevers" described as such by the College of Physicians.

4. What is the normal temperature of the body at completely sheltered parts, such as the axilla in the closed condition? What are the temperatures which represent "pyrexia" and "hyperexia"?

5. Describe the lesions in the abdominal viscera in cases of enteric fever.

MILITARY SURGERY.

SURGEON-GENERAL T. LONGMORE, C. B.

1. Enumerate the principal varieties of injuries of the head that may be inflicted by rifle-shot. Name their distinguishing symptoms, and give a short account of the treatment you would pursue in each variety.

2. Give an account of the medical examination of a recruit, particularizing all the separate points which have to be attended to in the examination.

3. A soldier is sent by a musketry instructor to a medical officer with a statement that the man was found able to aim correctly at rifle practice for the first three or four hundred yards, but is unable to aim correctly at distances beyond. An opinion is required as to whether his eyesight is defective; and, if so, what defect and what amount of defect he labors under.

Describe the steps you would take for answering the inquiry.

MILITARY MEDICINE.

SURGEON-GENERAL W. C. MACLEAN, M. D., C. B.

1. What are the precautions necessary to minimize the dangers of insolation (*a*) on the line of march, (*b*) in barracks, (*c*) in ships? Name the different varieties of this affection, and describe them,

showing the morbid state resulting from high temperature in the blood and tissues, and the most common sequels of insolation; and give the most rational treatment of the disease.

2. What are the most active causes of dysentery in hot climates? Describe the disease in its different stages, giving briefly the morbid appearances and the most successful treatment; contrast the mortality under it with that superseded, adding a short summary of the precautions necessary in the management of cases of this disease in invalids at sea.

In addition to the written examination, the candidate is subjected to a practical one in pathology and hygiene, in which he is required to analyze samples of milk, beer, wine, water, &c., placed before him, and to examine chemically and microscopically portions of tissue, and the unknown contents of packets, given him for the purpose. He must also describe and delineate the microscopic appearances presented.

The examinations held at the close of each session of the Army Medical School, of two of which the examples given are an illustration, are intended to test the proficiency of the candidates in the studies carried on at Netley, and to determine the order in which their names will appear for commission. The marks obtained at the second examination are added to those of the preliminary examination, and the result determines the candidate's place in the list of assistant surgeons.

After five years' service, assistant surgeons are again examined as a test for *promotion*. A series of questions is prepared by the examining board, and sent under seal to the principal medical officers of stations where assistant surgeons eligible for promotion are serving at the time.

The principal medical officer delivers these sealed questions to the assistant surgeons, and sees that they are answered without the assistance of books, notes, or communication with other persons. The answers are signed, sealed, and returned to the principal medical

officer, who sends them, unopened, to the director-general, together with a certificate from the surgeon of the regiment that the assistant has availed himself of every opportunity to practice surgical operations on the cadaver. The assistant is also required to send with his answers a medico-topographical account of his station, or a medico-statistical report of his regiment, for a period of one year. If the answers, certificates, and reports are considered satisfactory by the examining board and by the director-general, the assistant is pronounced qualified for *promotion*.

It thus appears that the medical officers of the army and navy in England are required to pass three examinations. The *first* or preliminary is "to ascertain, previous to his admission into the service as a candidate, his scientific and professional education. The *second*, after having passed through a course of special instruction in the Army Medical School at Netley, is to test his knowledge of his special duties as an army or navy medical officer; and the *third*, previous to his promotion, to ascertain that he has kept pace with the progress of medical science."—(Sydney Herbert.)

It has been my object to give in this report, I fear at the risk of some prolixity, a complete and detailed account of the systems of education for medical officers of the army and navy, adopted by France and England—two great and enlightened nations. Occupying, as they do, a foremost place among the mighty powers of Europe, and ever vying with each other in the improvement of their formidable military and naval forces, it is fair to assume that whatever they have done in this direction has been the result of the lessons of experience and of a well-grounded conviction of its utility.

It has been seen that in the former country during an entire century, though the land has been convulsed with revolutions which have overthrown almost all other institutions at one time or another, the naval medical schools in her great ports have been preserved through every changing dynasty; and that monarchy, empire, and republic have alike cherished them, and recognized the fact that they

gave vital help to the state as well as lustre to the fame of France. Some of the greatest names that adorn the annals of medicine are found to be those of men educated at these schools; and, in the skillful surgeons and learned savants they have furnished, the government has been repaid tenfold for its outlay.

And in our own noble mother country, fettered as she is by a national conservatism which binds her back from any forward movement, until it has been duly weighed and considered, a similar institution has been found a necessity which could no longer be dispensed with, and its establishment has all the more significance now that it is finally adopted.

Both these nations have sought through these schools to mitigate, as much as possible, the evils which war and disease bring on their people, and to keep their forces efficient and promptly available by land and sea. The two systems having the same object, yet differ from each other as widely as the character of the two nations, and it may be to our advantage to view them in comparison.

That of France is much older and longer established, having been organized considerably more than a hundred years ago; while that of England was inaugurated as recently as 1860. The former is, therefore, naturally more extended and complete; there being in France the three naval medical schools of Brest, Rochefort, and Toulon, and the army medical school at Val-de-Grace in addition, whereas in England there is but one school in common for the medical corps of the army, navy, and Indian services.

The French system is more liberal, as the state takes charge of the entire medical education of the candidate, supplying to him the rudimentary professional instruction as well as the more advanced, and, after giving him the advantages of gratuitous teaching for two years, sends him, at the public expense, to one of the great universities, at Paris or Montpellier, which are authorized to confer diplomas, and defrays all the cost of procuring his degree, and continues afterward

to afford him every facility for qualifying himself for promotion from grade to grade.

In England, on the other hand, no assistance is extended to any candidate by the government until he first, *at his own expense*, has obtained a medical education, taken a diploma, and successfully competed before an examining board for appointment to the army medical school, where he receives a supplementary and practical education only.

In France, all examinations of candidates are conducted by medical officers of the army and navy; but, in England, the first examination for admission into the service, and that for promotion afterward, are conducted by a board the members of which have no connection with military life.

Finally, in France, the medical officer is examined for promotion to every grade, and cannot obtain his advancement until he proves himself qualified; while in England the assistant surgeons are examined once for promotion to all grades.

But, while the government of France bestows its favors with a more liberal hand, it also requires more in return, and exacts from the recipient of its bounty a pledge of prolonged service, and, should he voluntarily withdraw from the obligation imposed on him, requires restitution of the outlay expended on him. Indeed, it is evident that without some such guarantee no government would find it to its interest to undergo such a great expenditure.

As to the relative value of the instruction received, I am inclined to believe that perhaps that obtained at Netley is more directly practical, and attains in a more complete manner its special object, that of training the candidate in the actual duties of his prospective position.

It is more limited in the subjects embraced, but it is well adapted to its purpose, and, like most things in England, is marked by the absence of non-essentials, by solid and substantial utility, and unostentatious thoroughness.

Still it must be conceded that the teaching in France is also most able, comprehensive, and useful, and it would seem to be easier in this, as in other instances, to contrast than to compare the different methods used to gain the same end by these two remarkable nations.

It is a thing that ought to fix our attention, however, that the earliest efforts to establish schools to give special training to army and navy surgeons, both in England and in France, arose from the observation that the medical officers were but imperfectly qualified for the wide range of duties required of them in great emergencies.

Dr. John Bell visiting the hospitals at Yarmouth after the battle of Camperdown, and M. Dupuy at Rochefort, when that port was crowded with sick and wounded after some of the engagements under Colbert, both declared such institutions necessary on the same ground, that the surgeons lacked the special training necessary to the perfect performance of their high functions.

Would a similar inquiry in relation to our service reveal a like state of affairs?

Perhaps this is a question which every medical officer can best answer for himself, and I would not do the medical corps of the Navy the injustice to affirm that it would, in a general sense. At the same time, I know no reason why the members of our service should be considered more intelligent, more devoted, or more zealous than our colleagues in England and France, *and it was true of them.* I for one am not ashamed to declare that I believe a special training in the schools of either England or France would greatly enhance the value of my services to the Government, both in peace and war. Moreover, knowing all that I do of the three services, I deem it my duty to say, in concluding this report, that such a school would be of immense advantage to the Navy of the United States, and that the absence of any such place of special training for the service is a defect that can not be remedied too soon.

LE Ap '09

LIBRARY OF CONGRESS
0 021 607 782 9